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7 route de Drize
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MASTER INDEX OF VOLUMES 1–10

Aarts, J.F.M. and F.J. de Heer, Emission cross sections for the second positive group of nitrogen produced by electron impact 1 (1969) 116
Abdulnur, S. and Y. Ohrn, Calculation of bounds to dispersion energies 6 (1970) 502
Åberg, T., see Manne 7 (1970) 282
Abouaf-Marguin, L., H. Dubost and F. Legay, Infrared spectra of matrix isolated ammonia at liquid helium temperature. Behavior during irradiation with a CO_2 laser beam 7 (1970) 61
Abraham, F.F. and J.V. Dave, The entropy of small clusters of atoms using an Einstein model 8 (1971) 351
Abrahamson, E.W., see Japar 2 (1968) 137
Abrahamson, E.W., see Andrews 10 (1971) 113
Abram, R.A. and A. Herzenberg, Rotational excitation of H_2 by slow electrons 3 (1969) 187
Abramowitz, S., see Levin 9 (1971) 247
Ackermann, F. and E. Miescher, Spin–orbit coupling in molecular Rydberg states of the nitric oxide molecule 2 (1968) 351
Ackerman, J.P., see Shain 3 (1969) 550
Adam, G., see Katriel 4 (1970) 596
Adam, G., see Katriel 6 (1970) 431
Adam, G., see Katriel 8 (1971) 191
Adam, G., see Katriel 10 (1971) 533
Adamov, M.N. and R.A. Evarestov, The superposition of the wavefunctions centered on the nuclei and the floating wavefunctions for H_2^+ 3 (1969) 726
Adamov, M.N. and R.A. Evarestov, The superposition of the wavefunctions centered on the nuclei and the floating wavefunctions for the ground state of the hydrogen molecule 9 (1971) 465
Adams, D.B., see Clark 10 (1971) 121
Adams, I., J.M. Thomas, M. Barber and R.H. Williams, Valence-band structure of gallium selenide from X-ray photoelectron spectroscopy 10 (1971) 297
Adams, J. and L. Leder, The effective rotary power of cholesterol 6 (1970) 90
Adams, R.F., N.M. Atherton, A.E. Goggins and C.M. Goold, ESR of complexes of 4-cyanopyridine and alkali metals 1 (1967) 48
Adams, R.F. and N.M. Atherton, On the ESR line shapes of systems undergoing intermolecular exchange 1 (1967) 351
Adams, R.F., T.L. Staples and M. Szwarc, ESR studies of electron-transfer reactions in the durosemiquinone system. Formation of the intermediate complex 5 (1970) 474
Adams, W.H., Perturbation theory for configuration-interaction wavefunctions 9 (1971) 199
Adloff, J.P., see Asch 5 (1970) 105
Adrian, F.J., Temperature and density dependence of the nuclear magnetic resonance chemical shift in xenon gas 7 (1970) 201
Adrian, F.J., Contribution of $S_0 \leftrightarrow T_{\pm 1}$ intersystem crossing in radical pairs to chemically induced nuclear and electron spin polarizations 10 (1971) 70
Agrawal, A.K., S. Yip and R.G. Gordon, Neutron scattering by liquid HCl 2 (1968) 584
Ahlrichs, R., see Kutzelnigg 1 (1967) 447
Ahlrichs, R. and W. Kutzelnigg, Ab-initio calculations of small hydrides including electron correlation 1 (1968) 651

Ahlrichs, R., see Gelus 7 (1970) 503
Ahlrichs, R., Error bounds for approximate Rayleigh–Schrödinger perturbation energies and wavefunctions 10 (1971) 157
Ahrland, S., Scales of softness for acceptors and donors 2 (1960) 303
Ahsan Ullah Khan, Luminescence bands of molecular oxygen from a tungsten lamp. The possible role of singlet molecular oxygen in surface catalyzed oxidation 4 (1970) 567
Airey, J.R. and S.F. Fried, Vibrational relaxation of hydrogen fluoride 8 (1971) 23
Akasaka, K., see Kominami 9 (1971) 510
Akins, D.L., see Fink 4 (1969) 283
Albrecht, A.C., see Sauter 2 (1968) 8
Albrecht, A.C., see Castonguay 7 (1970) 89
Albrecht, A.C., see Schwartz 9 (1971) 163
Alder, B.J., see Dymond 2 (1968) 54
Alfano, R.R. and S.L. Shapiro, Picosecond spectroscopy using the inverse Raman effect 8 (1971) 631
Alfassi, Z.B. and S. Amiel, On the importance of the average logarithmic energy loss in connection with the yields of hot halogen reactions 8 (1971) 487
Algar, B.E., see Stevens 1 (1967) 58, 219
Alkemade, C.Th.J., see Hooymayers 4 (1969) 277
Alkhimov, V.I., The Fokker–Planck equation in the excluded-volume problem of linear polymer chains 7 (1970) 581
Allen, J.D. and H. Shull, The overlap of two independently geminal representations for the OH bond 9 (1971) 339
Allen, L.C., Energy component analysis of rotational barriers 2 (1968) 597
Allen, L.C., see Kollmann 5 (1970) 75
Allen, L.C., see Jorgensen 7 (1970) 483
Allen, P.S. and C.J. Howard, On the model for a tunnelling methyl group 6 (1970) 169
Allison, A.C., see Dalgarno 2 (1968) 381
Allison, A.C., Quasi-bound states in H_2 3 (1969) 371
Almenningen, A., S.P. Arnesen, O. Bastiansen, H.M. Seip and R. Seip, The effect of temperature variation on the amplitudes of vibration and shrinkage effects in carbon suboxide studied by gas electron diffraction 1 (1968) 569
Altenberger, A.R. and J. Stecki, Surface tension and adsorption of regular solutions on the solid–liquid and vapour–liquid interface 5 (1970) 29
Al-Wattar, A.J.H. and M.D. Lumb, On the interpretation of iso-emissive points 8 (1971) 331
Amand, B., see Lavalette 10 (1971) 331
Ames, D.P., see Brown 1 (1967) 167
Amichai, O. and A. Treinin, Chemical reactivity of 0 (^{3}P) atoms in aqueous solution 3 (1969) 611
Amiel, S., see Alfassi 8 (1971) 487
Amme, R.C., see Behnen 8 (1971) 318
Amos, A.T. and J.I. Musher, A new description of interatomic and intermolecular interactions 1 (1967) 149
Amos, A.T., C. Laughlin and G.R. Moody, A generalized eigenvalue equation for the hydrogen atom 3 (1969) 411
Amos, A.T. and J.I. Musher, Intermolecular forces using spatial eigenfunctions 3 (1969) 721
Amos, A.T., J.I. Musher and H.G.Ff. Roberts, Orbital transformations and perturbation theory 4 (1969) 93
Amos, A.T., On the derivation of symmetry adapted perturbation theories 5 (1970) 587
Andersen, B., see Cyvin 2 (1968) 556

Anderson, A. and T.S. Sun, Raman spectra of molecular crystals. I. Chlorine, bromine, and iodine 6 (1970) 611
Anderson, A. and T.S. Sun, Raman spectra of molecular crystals. Carbon dioxide and nitrous oxide 8 (1971) 537
Anderson, A.B. and R.G. Parr, Universal force constant relationships and a definition of atomic radius 10 (1971) 293
Anderson, C.P., see Carlson 10 (1971) 561
Anderson, L.G., C.S. Parmenter, H.M. Poland and J.D. Rau, Intersystem crossing in glyoxal vapor. An experimental study of both the resonant and statistical limit 8 (1971) 232
Anderson, R.J., see Halgren 8 (1971) 547
Anderson, R.W., V. Aquilanti and D.R. Herschbach, Collisional excitation of K atoms by rare gases and diatomic molecules: correlation with electronic structure 4 (1969) 5
André, J.J. and G. Weill, Magnetic and optical properties of chloranil anion salts in the solid state 9 (1971) 27
André, J.-M., M.Cl. André and G. Leroy, Barrier to internal rotation in allene 3 (1969) 695
André, J.-M and G. Leroy, All-electrons band structure of polyethylene in the nearest cell approximation 5 (1970) 71
André, J.-M., G.S. Kapsomenos and G. Leroy, A comparison of ab initio extended Hückel and CNDO band structures for polyene and polyethylene 8 (1971) 195
André, M.Cl., see André 3 (1969) 695
Andreev, E.A. and A.I. Voronin, Intermultiplet mixing in alkali atoms induced by collisions with diatomic molecules 3 (1969) 488
Andrews, L.J. and E.W. Abrahamson, Formation of $O_2(^1\Sigma_g^+)$ by 1-fluoronaphthalene sensitization 10 (1971) 113
Andriessen, J., A calculation of the ground state of H_2O using a minimal basis set 3 (1969) 257
Angus, J.G. and G.C. Morris, Wannier type impurity states in naphthalene–rare gas matrices and the energy of the quasi-free electron state 5 (1970) 480
Anlauf, K.G., R.G. MacDonald and J.C. Polanyi, Infrared chemiluminescence from $H + O_3$, at low pressure 1 (1968) 619
Annersten, H., see Häggerström 4 (1969) 107
Antheunis, D.A., J. Schmidt and J.H. van der Waals, The dynamics of populating and depopulating of a phosphorescent triplet state as studied by microwave induced delayed phosphorescence 6 (1970) 255
Apfelderfer, B.Z. and K. Rosenheck, Amide wavefunctions and exciton bands in helical polypeptides 6 (1970) 200
Aquilanti, V., see Anderson 4 (1969) 5
Arnesen, S.P., see Almenningen 1 (1968) 569
Arnold, G.M. and R. Heastie, Far infrared absorption in each solid phase of HCl and DBr 1 (1967) 51
Arnold, S.J. and G.H. Kimbell, Infrared chemiluminescence in the reactions of oxygen atoms with carbon disulphide 3 (1969) 469
Arnold, S.J. and D.R. Bates, Use of JWKB approximation for single-electron molecules 3 (1969) 632
Arnold, S.J., see Suart 5 (1970) 519
Arnold, S.J., see Suart 7 (1970) 337
Arrighini, G.P., M. Maestro and R. Moccia, Electric polarizability of polyatomic molecules 1 (1967) 242, 427
Arrighini, G.P. and C. Guidotti, Experimental data and ab initio calculations of some one-electron properties of the H_2O molecule: a comparison 6 (1970) 435
Arrighini, G.P., M. Maestro and R. Moccia, Magnetic properties of polyatomic molecules. III. Magnetic shielding constants of heavy nuclei in $H_2{}^{17}O$, $^{14}NH_3$, $^{13}CH_4$ and $^{13}CH_3F$ 7 (1970) 351

Åsbrink, L., O. Edqvist, E. Lindholm and L.E. Selin, The electronic structure of benzene 5 (1970) 192
Åsbrink, L., E. Lindholm and O. Edqvist, Jahn–Teller effect in the vibrational structure of the photoelectron spectrum of benzene 5 (1970) 609
Åsbrink, L., The photoelectron spectrum of H_2 7 (1970) 549
Asch, L., J.P. Adloff, J.M. Friedt and J. Danon, Motional effects in the Mössbauer spectra of iron (II) hexammines 5 (1970) 105
Ascher, E., Symmetry changes in continuous transitions. A simplified theory applied to V_3Si 1 (1967) 69, 246
Asselin, M. and C. Sandorfy, A low temperature infrared study of the band-width and frequency in self-associated alcohols 8 (1971) 601
Astier, R. and Y.H. Meyer, First allowed triplet–triplet transition in benzene 3 (1969) 399
Astier, R., see Meyer 4 (1970) 587
Asundi, R.K. and Ch.V.S. Ramachandrarao, Revised Franck–Condon factors for the ionization transition of O_2 and the second negative band system of O_2^+ 4 (1969) 89
Atherton, N.M., see Adams 1 (1967) 48, 351
Atherton, N.M., A.J. Blackhurst and I.P. Cook, ENDOR experiments using intense radiofrequency fields: incipient decoupling of the hyperfine interaction 8 (1971) 187
Atkins, P.W., R.C. Gurd, K.A. McLauchlan and A.F. Simpson, Electron spin resonance emission spectra in solution 8 (1971) 55
Atkinson, R. and B.A. Thrush, Collisional quenching in the photochemical isomerisation of 1, 3, 5-cycloheptatriene 3 (1969) 684
Aurich, F., Measurement of the decay time of scintillation intensity by correlation analysis 4 (1970) 573
Aurich, F. and J. Marquard, Fast depopulation of triplet exciton traps and delayed fluorescence of crystalline benzene 8 (1971) 91
Avakian, P., see Merrifield 3 (1969) 155, 728
Avakian, P., see Groff 5 (1970) 168
Axtmann, R.C., see Hazony 2 (1968) 440
Axtmann, R.C., Y. Hazony and J.W. Hurley Jr., 3d electron delocalization from Mössbauer measurements on ferrous halides 2 (1968) 673
Axtmann, R.C., see Hazony 8 (1971) 571
Azima, A., P.Grunberg, J. Hoff, J.A. Koningstein and J. Preudhomme, Raman scattering of Co^{2+} 7 (1970) 565
Ažman, A., J. Koller and D. Hadži, A CNDO calculation of ring models of polywater 5 (1970) 157

Babenko, S.D., V.A. Benderskii, A.G. Levrushko and V.P. Tychinskii, Annihilation of singlet excited states in anthracene solutions 8 (1971) 598
Bach, B., E.L. Evans, J.M. Thomas and M. Barber, Monitoring changes in the band structure of graphite following chemical reaction: an X-ray-induced photo-electron study of intercalation 10 (1971) 547
Bader, R.F.W. and R.A. Gangi, The lowest singlet and triplet potential surfaces of H_2O 6 (1970) 312
Bader, R.F.W. and P.M. Beddall, The spatial partitioning and transferability of molecular energies 8 (1971) 29
Bader, R.F.W., O.A. Novaro and V. Beltran-Lopez, Non-additivity of intermolecular forces in He_3 within the SCF LCAO MO approximation 8 (1971) 568
Bader, R.F.W., see Duke 10 (1971) 631
Badger, B., B. Brocklehurst and R.D. Russell, The naphthalene dimer cation $(C_{10}H_8)_2^+$ 1 (1967) 122
Bae, J.H., A simple intermolecular potential energy function for nonpolar molecules 4 (1969) 139

Baede, A.P.M., A.M.C. Moutinho, A.E. de Vries and J. Los, Total cross sections for charge transfer between alkali atoms and halogen molecules 3 (1969) 530
Baer, M., Moderation processes of hot atoms in a gaseous medium 3 (1969) 629
Baer, T., W.B. Peatman and E.W. Schlag, Photoionization resonance studies with a steradiancy analyzer. II. The photoionization of CH_3I 4 (1969) 243
Baessler, H., see Vaubel 10 (1971) 334
Baggio-Saitovitch, E., see Friedt 7 (1970) 603
Bair, E.J., see Biedenkapp 5 (1970) 379
Baird, M.C., see Gillies 7 (1970) 451
Baird, N.C., The prediction of bond lengths by ab initio SCF LCAO MO calculations using STO 2G expansions 6 (1970) 61
Baise, A.I., Far infrared absorption in compressed nitrous oxide 9 (1971) 627
Baiwir, M., Electron spin resonance of phosphorescent dibenzothiophene 9 (1971) 482
Baker, K.A., see Christoffersen 8 (1971) 4
Balasubramaniam, D., see Gupta 7 (1970) 500
Balazs, N.L., see Tobias 4 (1969) 205
Bales, B.L. and L. Kevan, EPR of Ag^0 site conversion in gamma-irradiated frozen $AgNO_3$ ices 3 (1969) 484
Bales, B.L. and M.E. Baur, ESR studies of DTBN in a model lipid–water system 7 (1970) 341
Bales, B.L., EPR of frozen aqueous solutions of Fremy's salt: resolution enhancement of polycrystalline spectra 10 (1971) 361
Balint-Kurti, G.G., see Levine 6 (1970) 101
Balint-Kurti, G.G., and R.D. Levine,Opacity analysis of inelastic molecular collisions. Computational studies of the exponential Born approximation for rotational excitation 7 (1970) 107
Balint-Kurti, G.G., see Johnson 7 (1970) 268
Ballhausen, C.J., see Krause 3 (1969) 297
Bancroft, G.M., see Williams 3 (1969) 110
Bancroft, G.M., M.J. Mays and B.E. Prater, The single line Mössbauer spectrum of $[Fe(NH_3)_6]^{2+}$ 4 (1969) 248
Bancroft, G.M., The sign of the ^{59}Co quadrupole splitting in Co (III) compounds, and the magnitude of the ^{57}Fe quadrupole moment 10 (1971) 449
Banerjee, K., see Krishan 3 (1969) 679
Barber, M., J.A. Connor and I.H. Hillier, On the origin of satellite peaks in the high energy photoelectron spectra of some transition metal carbonyls 9 (1971) 570
Barber, M., see Adams 10 (1971) 297
Barber, M., see Bach 10 (1971) 547
Bard, A.J., see Goldberg 7 (1970) 139
Bardsley, J.N., The ionization of molecules near threshold 1 (1967) 229
Bardsley, J.N., F. Mandl and A.R. Wood, The structure of the 2 eV N_2^- resonance 1 (1967) 359
Bardsley, J.N., The analysis of molecular resonant states 2 (1968) 329
Bardsley, J.N. and F.H. Read, Predicted angular distribution for resonant scattering of electrons by molecules 2 (1968) 333
Bardsley, J.N., Pseudopotential calculations of alkali interactions 7 (1970) 517
Barfield, M., Anisotropy of the indirect nuclear spin–spin coupling constant 4 (1970) 518
Erratum 5 (1970) 316
Bargon, J., see Charlton 8 (1971) 442
Barili, P.L. and C.A. Veracini, Temperature dependence of the geometry of *p*-dinitrobenzene in a nematic phase 8 (1971) 229

Barker, J.A. and R.O. Watts, Structure of water; a Monte Carlo calculation 3 (1969) 144
Barnes, J.A., W.E. Hatfield and D.J. Hodgson, The magnetic and spectral properties of the di-μ-chlorobis[trichlorocuprate (II)] anion, $[Cu_2Cl_8]^{4-}$ 7 (1970) 374
Barnes, R.G., see Segel 2 (1968) 613
Barnes, R.G., see Macalady 5 (1970) 186
Barnoi, T., see Goldstein 10(1971) 136
Baron, M.H., see De Lozé 9 (1971) 103
Barr, T.L., see Nesbet 4 (1969) 203
Barrow, T. and R.N. Dixon, A visible absorption system of NSF 4 (1970) 547
Bartlett, R.H., see Brändas 8 (1971) 153
Basch, H., see Hollister 3 (1969) 185, 728
Basch, H., see Brundle 3 (1969) 292
Basch, H. and L.C. Snyder, ESCA: chemical shifts of K-shell electron binding energies for first-row atoms in molecules 3 (1969) 333
Basch, H., C. Hollister and J.W. Moskowitz, Geometry and electronic states of CuF_2 4 (1969) 79
Basch, H., see Chang 5 (1970) 147
Basch, H., On the interpretation of K-shell electron binding energy chemical shifts in molecules 5 (1970) 337
Basco, N., D.G.L. James and F.C. James, A kinetic study of the combination reaction $CH_3 + O_2$ 8 (1971) 265
Basco, N. and F.G.M. Hathorn, The electronic absorption spectrum of the tri-fluoro-methyl radical 8 (1971) 291
Baslaev, Y.A., E.A. Kravchenko, V.I. Pachomov, V.M. Skorikov and G.K. Semin, NQR-^{209}Bi spectra of several $Bi_nA_l^{IV}O_m$-type crystals 3 (1969) 455
Bass, A.M., see Pilling 9 (1971) 147
Bassett, P.J. and D.R. Lloyd, He(I) resonance photoelectron spectra of group IV tetra-fluorides 3 (1969) 22
Bassett, P.J. and D.R. Lloyd, The photoelectron spectra of nitrogen trifluoride and nitrogen oxide trifluoride, and a reassignment of the spectra of tetrafluorides of group IV 6 (1970) 166
Bassett, P.J., D.R. Lloyd, I.H. Hillier and V.R. Saunders, A theoretical and experimental study of the electronic structure of PF_3O and the ligand properties of PF_3 6 (1970) 253
Bassez, M.-P., see Vidal 5 (1970) 398
Bastiansen, O., see Almenningen 1 (1968) 569
Bates, D.R., see Arnold 3 (1969) 632
Bates, D.R. and D. Sprevak, Forced common turning point procedure and excitation in slow H^+–H (1s) collisions 10 (1971) 428
Bates Jr., R.D., J.T. Knudtson, G.W. Flynn and A.M. Ronn, Energy transfer among exited vibrational states of SF_6 8 (1971) 103
Batley, M. and D.R. Kearns, The second triplet state of benzophenone 2 (1968) 423
Bauer, M.E., see Bales 7 (1970) 341
Bauer, S.H., see Lin 7 (1970) 223
Bauser, H., see Klöpffer 6 (1970) 279
Bauser, H. and W. Klöpffer, Steady-state photocurrent action spectra in polyvinyl carbazole 7 (1970) 137
Baxendale, J.H., D. Beaumond and M.A.J. Rodgers, Fluorescence in the nanosecond pulse radiolysis of dioxan 4 (1969) 3
Baybarz, R.D., see Nugent 7 (1970) 179
Baybutt, P., see Roach 7 (1970) 7
Bazley, N.W. and H.R. Fankhauser, Point-wise estimates of eigenfunctions for Schrodinger operators 7 (1970) 121

Beagley, B. and K.T. McAloon, On electron-diffraction complex scattering factors for tin 10 (1971) 78
Beaumond, D., see Baxendale 4 (1969) 3
Bebelaar, D., see Lavalette 9 (1971) 230
Beck, K.H., see Bücher 3 (1969) 508
Becker, K.H. and D. Kley, The formation of CH radicals in hydrocarbon atom flames 4 (1969) 62
Becker, K.H., W. Groth and D. Thran, The air glow reaction NO + O + (M) → NO_2^* + (M) at low pressures 6 (1970) 583
Becker, K.H., W. Groth and U. Schurath, The quenching of metastable $O_2(^1\Delta_g)$ and $O_2(^1\Sigma_g^+)$ molecules 8 (1971) 259
Beddall, P.M., see Bader 8 (1971) 29
Beens, H. and A. Weller, Triple complex formation in the excited state 2 (1968) 140
Beens, H. and A. Weller, Solvent dependence of the emission from species consisting of two identical moieties 3 (1969) 666
Beens, H., H. Möhwald, D. Rehm, E. Sackmann and A. Weller, Fluorescence polarization studies of hetero-excimers oriented in liquid crystals 8 (1971) 341
Behnen, S.W., H.L. Rothwell and R.C. Amme, Vibration–rotation energy transfer between $CO_2(\nu_2)$ and orthohydrogen 8 (1971) 318
Bélanger, G., P. Sauvageau and C. Sandorfy, The far-ultraviolet spectra of perfluoro-normal-paraffins 3 (1969) 649
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Bellemans, A., see Orban 1 (1967) 205
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Bellemans, A. and J. Orban, Excess free energy of a two-component mixture of hard spheres slightly different in size 2 (1968) 253
Bellon, F., see Zelsmann 6 (1970) 513
Belton, P.S. and H.J.V. Tyrrell, Thermal diffusion in a horizontal liquid film heated from below 4 (1970) 619
Beltrán-López, V., see Bader 8 (1971) 568
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Bendazzolli, G.L., P. Palmieri and C. Zauli, Wavefunctions for He by rotational projection 8 (1971) 556
Bender, C.F. and E.R. Davidson, Unitary transformations and pair energies 3 (1969) 33
Bender, C.F., see Pipano 4 (1970) 583
Bender, C.F., see Pritchard 5 (1970) 529
Benderskii, V.A., see Babenko 8 (1971) 598
Benesch, R. and V.H. Smith Jr., Radial momentum distributions for the ^2S ground state of the lithium atom 5 (1970) 601
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Bennett, J.E. and J.A. Howard, ESR spectrum of the α-styryl radical 9 (1971) 460
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Benninghoven, A., Observing surface oxidation of molybdenum with the statical method of secondary ion mass spectroscopy 6 (1970) 626
Ben-Reuven, A., see Szöke 1 (1967) 87
Ben-Reuven, A., On the Yaris and Shain method for calculating lineshapes 5 (1970) 273
Bensasson, R., see Bonneau 3 (1969) 353
Bensasson, R., see Lavalette 10 (1971) 331
Bensasson, R.V., J.T. Richards and J.K. Thomas, The pulsed laser photolysis of benzene in cyclohexane 9 (1971) 13
Bensing, J.L. and E.S. Pysh, Higher energy excitons in polypeptide films 4 (1969) 120
Benson, R.C. and W.H. Flygare, The molecular Zeeman effect in propene and comparison of the magnetic susceptibility anisotropies with cyclopropene and other small ring compounds 4 (1969) 141
Benson, R.C., see Norris 10 (1971) 75
Berge, P., see Dubois 6 (1970) 227
Berger, J.J., see Verhaegen 9 (1971) 479
Berkowitz, J. and W.A. Chupka, Diatomic ions of noble gas fluorides 7 (1970) 447
Berlman, I.B., see Goldschmidt 2 (1968) 520, 536
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Bernstein, H.J., see Mohanty 4 (1970) 570
Bernstein, H.J., see Holzer 4 (1970) 641
Bernstein, H.J., see Kiefer 8 (1971) 381
Bernstein, H.J., see Perchard 8 (1971) 559
Bernstein, R.B., see Lester Jr. 1 (1967) 207
Bernstein, R.B., see Johnson 1 (1967) 396
Bernstein, R.B., see Levine 1 (1968) 517
Bernstein, R.B., see Beuhler Jr. 2 (1968) 166
Bernstein, R.B., see Roberts 2 (1968) 366
Bernstein, R.B., see Waech 2 (1968) 477
Bernstein, R.B., see Beuhler Jr. 3 (1969) 118
Bernstein, R.B., see Bickes Jr. 4 (1969) 111
Bernstein, R.B., see Muckerman 4 (1969) 183
Bernstein, R.B., see Gersh 4 (1969) 221
Bernstein, R.B., see LeRoy 5 (1970) 42
Bernstein, R.B., see Gillen 5 (1970) 275
Bernstein, R.B., see Roberts 6 (1970) 282
Berry, R.S., see Nielsen 2 (1968) 503
Berry, R.S., see Tully 9 (1971) 80
Bersohn, M., see Chiang 1 (1968) 521
Bertini, V., see Bucci 1 (1967) 473
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Erratum 3 (1969) 118
Beveridge, D.L. and J.W. McIver Jr., INDO molecular orbital calculation of anisotropic hyperfine coupling constants 4 (1969) 126
Bhagchandani, C.L., see Pant 9 (1971) 546
Bhandari, R.C., see Jain 2 (1968) 33
Bhattacharjee, H.R., see Lim 9 (1971) 249
Bhattacharyya, T.J., H.P. Roy and D.Das Gupta, Dielectric properties of critical mixtures 4 (1970) 541
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Bingel, W.A., see Kutzelnigg 1 (1967) 447
Bingel, W.A., see Kutzelnigg 2 (1968) 197
Bingel, W.A., Correlation coefficients for electronic wavefunctions of atoms in S-states and linear molecules 5 (1970) 367
Binsch, G., E. Heilbronner, R. Jankow and D. Schmidt, On the fluorescence anomaly of azulene 1 (1967) 135
Bird, B.D., see LoMenzo 9 (1971) 332
Birks, J.B. and J. Grzywacz, Prompt and delayed fluorescence of dyes in solid solution 1 (1967) 187
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Birks, J.B. and A.A. Kazzaz, Experimental determination of the pyrene crystal excimer interaction potential 1 (1967) 307
Birks, J.B. and S. Georghiou, Fluorescence decay and energy transfer in viscous solutions 1 (1967) 355
Birks, J.B., Higher excited states of benzene and toluene excimers 1 (1968) 625
Birks, J.B., see Vander Donckt 2 (1968) 409
Birks, J.B., Triplet–triplet interaction of aromatic molecules in solution 2 (1968) 417
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Birnbaum, G. and W. Ho, Pure rotational spectrum of HCl and DCl in liquid SF_6 5 (1970) 334
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Bishop, D.M. and B.E. Schneider, An integral transform trial function for helium-like systems 6 (1970) 566
Erratum 7 (1970) 396
Bishton, S.S., see Newman 1 (1968) 616
Bist, H.D., see Verma 4 (1970) 577
Bist, H.D., see Sarin 6 (1970) 473

Bjerre, A. and E.E. Nikitin, Energy transfer in collisions of an excited sodium atom with a nitrogen molecule 1 (1967) 179
Black, G., see Slanger 4 (1970) 558
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Blackhurst, A.J., see Atherton 8 (1971) 187
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Blaunstein, R.P., see Easterly 6 (1970) 579
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Blinc, R., see Lavrenčič 5 (1970) 441
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Blondeau, J.M. and M. Stockburger, Resonance fluorescence and electronic relaxation in naphthalene vapor 8 (1971) 436
Bloom, M., see Lalita 8 (1971) 285
Bloor, J.E., see Billingsey 4 (1969) 48
Blum, L., see Weissmann 1 (1967) 95
Bockris, J.O'M., see O'Grady 5 (1970) 116
Boden, N. and R. Folland, Nuclear magnetic spin–lattice relaxation by spin–rotational interaction in plastic crystalline white phosphorous 10 (1971) 167
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Boerboom, A.J.H., see Knoop 5 (1970) 450
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Böhme, U.R. and G.W. Jesse, ENDOR studies of radiation-induced dibenzocyclohexadienyl in anthracene single crystals 3 (1969) 329
Bolden, R.C., see Hemsworth 5 (1970) 237
Bolden, R.C., see Shaw 8 (1971) 148
Bollmark, P. and B. Lindgren, Absorption spectra of SbH and SbD radicals 1 (1967) 480
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Bonačić, V., see Koutecký 10 (1971) 401
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Bonham, R.A., see Fink 4 (1969) 347

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Bonham, R.A. and E.W. Ng, On the calculation of total electron inelastic scattering cross sections for neutral atoms in the keV energy range 4 (1969) 355
Bonham, R.A. and E.W. Ng, Improved total inelastic scattering cross section for the rare gases 6 (1970) 403
Erratum 7 (1970) 395
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Bonn, R., see Wegdam 2 (1968) 182
Bonneau, R., J. Faure and J. Joussot-Dubien, Singlet–singlet absorption and intersystem crossing from the $^1B_{3u^-}$ state of naphthalene 2 (1968) 65
Bonneau, R., J. Joussot-Dubien and R. Bensasson, Giant pulse laser photolysis of benzene and mesitylene 3 (1969) 353
Borkman, R.F., Deuterium effect on the phosphorescence lifetime of biacetyl crystal and vapor 9 (1971) 77
Borkman, R.F., Electric quadrupole moments for H_2^+, H_2, and H_3^+ from a point charge model 9 (1971) 624
Borne, T.B., see Peatman 3 (1969) 492
Bottcher, C., The formalism of electron-molecule scattering 4 (1969) 320
Bottcher, C., see Dalgarno 7 (1970) 265
Bottcher, C., A simple model for the scattering of electrons by a rotating dipole 9 (1971) 57
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Boyd, G.E., see Brooker 5 (1970) 357
Boyd, G.E., see Brooker 9 (1971) 242
Boyd, R.J. and D.C. Frost, The ionization potentials of BF_3, BCl_3 and BBr_3 1 (1968) 649
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Boyle, L.L., The shape of an octahedral hybrid orbital 4 (1970) 625
Boyle, L.L., The construction of hybrid orbitals from irreducible tensors 5 (1970) 493
Braams, R., see de Bie 4 (1969) 331
Braams, R., see de Bie 8 (1971) 208
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Bradbury, M.I. and D.J. Newman, Interpretation of Gd^{3+} superexchange parameters in the anhydrous chlorides 2 (1968) 495
Bradley Moore, C., see Hao-Lin Chen 2 (1968) 593
Brand, P.A.T.M., see Den Hollander 10 (1971) 430
Brändas, E., see Goscinski 2 (1968) 299
Brändas, E. and O. Mårtensson, Wavefunction constructed from complex hybrids 3 (1969) 315
Brändas, E.J. and R.H. Bartlett, Reduced partitioning technique for configuration interaction calculations using Padé approximants and inner-projections 8 (1971) 153
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Braun, W., see Pilling 9 (1971) 147
Braunstein, R., see Biscar 2 (1968) 435
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Breitschwerdt, K.G., Molecular motion and ultrasonic absorption in aqueous solutions 6 (1970) 587
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Brennen, W., see Shane 4 (1969) 31
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9 (1971) 285
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Brinen, J.S., G.E. Gerhardt and J. Kazan, Triplet–triplet absorption via intra-molecular energy transfer 5 (1970) 150
Brinen, J.S., see Gallivan 10 (1971) 455
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Brion, C.E., C.R. Eaton, L.A.R. Olsen and G.E. Thomas, Threshold excitation and ionization of xenon by electron impact 3 (1969) 600
Brion, C.E., see Van der Wiel 7 (1970) 161
Brith, M., see Katz 2 (1968) 189
Brocklehurst, B., see Badger 1 (1967) 122
Brocklehurst, B. and J.S. Robinson, Light emission from gamma-irradiated alkane glasses containing olefins 10 (1971) 277
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Brongersma, H.H., see Knoop 5 (1970) 450
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Brot, C., see Lassier 1 (1968) 581
Brot, C., see Lassier 3 (1969) 96
Brot, C., The pre-exponential factor in activated reorientational processes 3 (1969) 319
Brot, C., see Darmon 7 (1970) 53
Brot, C., see Darmon 8 (1971) 454
Brotikovsky, O.I., see Zhidomirov 10 (1971) 341
Brown, I.M., D.J. Sloop and D.P. Ames, Spin–lattice relaxation of the biphenyl anion radical in a rigid matrix 1 (1967) 167
Brown, I.M. and D.J. Sloop, The direct process in the spin–lattice relaxation of DPPH in a rigid matrix 1 (1968) 579
Brown, I.M., see Jones 2 (1968) 493
Brown, R.D., see Blackman 1 (1967) 379
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Brown, R.J.C., see Hurst 1 (1968) 647
Brown, R.J.C., Observability of spin-rotation relaxation in ionic solids 2 (1968) 501
Brown, W.G., see Horrocks 5 (1970) 117
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Brunelli, M., see Paladino 5 (1970) 15
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Buch, T., see Ortega 3 (1969) 35
Buchachenko, A.L., see Lippmaa 5 (1970) 521
Buchanan, D.N.E., see Wertheim 3 (1969) 87

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Bücher, H., see Inacker 7 (1970) 213
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Buenker, R.J., see Peyerimhoff 8 (1971) 129
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Burden, F.R., see Blackburn 7 (1970) 102
Burden, F.R., see Brown 7 (1970) 461
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Erratum 5 (1970) 444
Burgos, J., see Wotherspoon 5 (1970) 453
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Burr, J.G., see Simpson 2 (1968) 383
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Burton, J.J., Anomalous entropy of small clusters of atoms 7 (1970) 567
Buschmann, H.W. and W. Groth, Formation of carbon dioxide and carbon suboxide by an energy transfer process in the gamma radiolysis of liquid and solid carbon monoxide 2 (1968) 245
Busse, H., see Bennewitz 8 (1971) 235
Butchard, J.A., R.F. Claridge and L.F. Phillips, Hg_2 fluorescence in low-temperature solids 8 (1971) 139
Buttet, J., The unpaired electrons in a sulphur chain 1 (1967) 297
Büttner, H. and E. Gerlach, Van der Waals-interaction of ionic and covalent crystals 5 (1970) 91
Byers Brown, W., Perturbation theory of atomic interactions at short range 1 (1968) 655
Byers Brown, W., On Jansen's perturbation theory for exchange interactions 2 (1968) 105
Byers Brown, W. and D.M. Whisnant, Long-range interatomic dipoles 7 (1970) 329
Bylina, A., Triplet–triplet energy transfer and the overlap of singlet–triplet bands of sensitizer and acceptor. Remarks on the 'phantom triplet' of stilbene 1 (1968) 509

Cabana, A., see Chapados 7 (1970) 191
Cade, P.E., see Henneker 2 (1968) 575
Cadet, C., see Lorquet 6 (1970) 198
Caldow, G.L., Some calculations on the vertical ionization potentials of fluorine-substituted benzenes 2 (1968) 88
Callear, A.B., see van den Bergh 4 (1969) 101
Callear, A.B., see Breckenbridge 5 (1970) 17
Callear, A.B. and H.E. van den Bergh, Relaxation of excited methyl radicals produced in the flash photolysis of dimethyl mercury 5 (1970) 23
Callear, A.B. and P.M. Wood, Rates of energy transfer from $N_2 A^3\Sigma_u^+$ to atomic mercury and nitric oxide 5 (1970) 128
Callear, A.B. and J.C. McGurk, Deactivation of Hg (6^3P_0) 6 (1970) 417
Callear, A.B. and J.C. McGurk, Relaxation of Hg (6^3P_0) by NH_3 in ternary collisions 7 (1970) 491
Callear, A.B. and H.E. van den Bergh, An hydroxyl radical infrared laser 8 (1971) 17
Callear, A.B., see Koskikallio 8 (1971) 467
Calloway, A.R., see Jones 10 (1971) 438
Calvert, J.McI. and W.D. Davison, A numerical single-centre calculation of the polarizabilities of H_2 4 (1969) 327
Cameron, J.A., P.R. Gardner, L. Keszthelyi and W.V. Prestwich, Dynamical effects on ^{181}Ta nuclei in ice 4 (1969) 229
Cameron, J.A., L. Keszthelyi, G. Nagy and L. Kacsóh, Mössbauer effect of ferrous ions in cubic ice 8 (1971) 628
Caminati, W., see Mirri 8 (1971) 409
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Campbell, J.D. and J.V.V. Kasper, Hyperfine structure in the CF_3Br photodissociation laser 10 (1971) 436

Candori, R. and C. Furlani, Energy transfer between different luminescent centers in some double complexes of Cr (III) 5 (1970) 153
Canright Jr., R.B., see Dugan Jr. 8 (1971) 253
Canters, G.W., E. de Boer, B.M.P. Hendriks and H. van Willigen, Alkali metal NMR experiments on alkali–aromatic radical ion pairs in solution 1 (1968) 627
Caplan, P.J., see Dwek 3 (1969) 283
Carbó, R., Nota on a Roothaan procedure 8 (1971) 75
Carlson, T.A., W.E. Moddeman, B.P. Pullen and M.O. Krause, Identification of high energy lines in the K-LL Auger spectrum of N_2 5 (1970) 390
Carlson, T.A., Angular dependence of vibrational structure in the photoelectron spectra of N_2 and C_2 9 (1971) 23
Carlson, T.A. and C.P. Anderson, Angular distribution of the photoelectron spectrum for benzene 10 (1971) 561
Carr Jr., H.R.W., see Eder 3 (1969) 520
Carter, J.G., see Christophorou 2 (1968) 607
Carter, J.G., see Christophorou 3 (1969) 237
Carter, J.G., see Wagner 4 (1969) 224
Carter, J.G., see Collins 4 (1970) 646
Carter, J.G., see Easterly 6 (1970) 579
Cartwright, D.C., see Truhlar 9 (1971) 299
Castellano, E., see von Ellenrieder 9 (1971) 152
Castonguay, R. and A.C. Albrecht, Multiple long lived emissions from *p*-dimethoxybenzene in rigid media 7 (1970) 89
Castro, G. and R.M. Hochstrasser, A high magnetic field study of the triplet state of hexachlorobenzene 6 (1970) 180
Cavalière, P., see Bucci 5 (1970) 605
Cavallini, M., G. Gallinaro, L. Meneghetti, G. Scoles and U. Valbusa, Rainbow scattering and the intermolecular potential of argon 7 (1970) 303
Cavallini, M., M.G. Dondi, G. Scoles and U. Valbusa, Non-spherical potentials and molecular scattering at thermal energies. Nitrogen and the noble gases 10 (1971) 22
Ceasar, G.P., see Buckingham 3 (1969) 540
Ceccaldi, D., see Bullot 6 (1970) 605
Ceccaldi, D. and J. Bullot, Theoretical description of the isothermal recombination luminescence following the photoionization of a rigid organic solution 9 (1971) 551
Ceccarelli. G., see Bucci 1 (1967) 473
Ceccarelli, G., see Bucci 3 (1969) 55
Čermák, V. and Z. Herman, Penning ionization electron spectroscopy; ionization of mercury 2 (1968) 359
Čermák, V., Penning ionization electron spectroscopy. Spectroscopy of excited long-lived molecular states 4 (1970) 515
Certain, P.R., see Johnson 1 (1967) 413
Certain, P.R. and J.O. Hirschfelder, Localized orbitals for arbitrary molecular wave-functions 2 (1968) 274, 539
Certain, P.R., J.O. Hirschfelder and S.T. Epstein, Application of exchange perturbation theories to the delta-function model of H_2 4 (1969) 401
Chaddha, G., ESR of Mn^{2+} in $BaCl_2.2H_2O$ 1 (1967) 414
Chadwick, D. and D.J. Millen, Nuclear quadrupole coupling tensor in dibromomethane from its microwave spectrum 5 (1970) 407
Chaikin, A.M., see Kapralova 2 (1968) 581
Chakrabarti, S.K., see Lim 1 (1967) 28

Chalaye, M., E. Dayan and G. Levy, Infrared rotational correlation functions and intermolecular mean squared torques of compressed gaseous linear molecules 8 (1971) 337
Chamberlain, J., see Davies 2 (1968) 411
Chamberlain, J., On the submillimetre wave refraction of liquids 2 (1968) 464
Chamberlain, J.E., H.A. Gebbie, G.W.F. Pardoe and M. Davies, Millimetre-wave Fourier transform spectroscopy for studies of the liquid state 1 (1968) 523
Chan, H.H. and M. Razavy, On the theory of natural line breadth 2 (1968) 202
Chan, I.Y., J. Schmidt and J.H. van der Waals, Optical detection of ENDOR in a zero-field transition of phosphorescent quinoxaline 4 (1969) 269
Chandler, G.S., Generalized Hulthén type radial functions as an approximation to Hartree–Fock 2p functions 3 (1969) 311
Chandra, A.K., Origin of the stability of aromatic hydrocarbon dimers 5 (1970) 229
Chandross, E.A. and H.T. Thomas, Intramolecular exciplex formation in naphthyl-alkylamines 9 (1971) 393
Chandross, E.A. and H.T. Thomas, The interaction of amine-hydrocarbon exciplexes with small dipolar molecules–stoichiometric complex formation 9 (1971) 397
Chaney, E.L., see Christophorou 3 (1969) 363
Chaney, E.L., see Collins 4 (1970) 646
Chang, H.W., D.W. Setser, M.J. Perona and R.L. Johnson, Comparison of energy partitioning by the reactions of fluorine atoms with hydrogen sulphide, water, hydrogen peroxide, and methane 9 (1971) 587
Chang, T.Y. and H. Basch, Intersystem crossing in methylene 5 (1970) 147
Chantry, G.W., see Lassier 3 (1969) 96
Chantry, G.W., J.W. Fleming, P.M. Smith, M. Cudby and H.A. Willis, Far infrared and millimetre-wave absorption spectra of some low-loss polymers 10 (1971) 473
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Charlton, J.L. and J. Bargon, Chemically induced dynamic nuclear polarization at zero magnetic field 8 (1971) 442
Chaturvedi, G.C., see Rao 7 (1970) 563
Che, M., see Meriaudeau 5 (1970) 131
Che, M. and C. Naccache, Nature of paramagnetic species produced by oxygen treatment of titanium dioxide 8 (1971) 45
Chen, C.R. and M.A. El-Sayed, The relative signs of the zero-field parameters from phosphorescence-microwave double resonance (PMDR) spectroscopy: 1,2,4,5 tetrachlorobenzene 10 (1971) 307
Chen, C.R., see El-Sayed 10 (1971) 313
Chen, R. and G.A. Haber, Calculation of glow curves' activation energies by numerical initial rise method 2 (1968) 483
Chen, R., On the kinetics of the thermally stimulated conductivity 6 (1970) 125
Erratum 9 (1971) 488
Chen, R., M. Israeli and N. Kristianpoller, Dependence of the excitation of glow curves on the absorption coefficient 7 (1970) 171
Chen, S.N. and G.B. Porter, The role of doublet and quartet states in the photo-aquation of the reineckate ion 6 (1970) 41
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Chiang, T.C. and M. Bersohn, The EPR observation of ^{19}F hyperfine splittings in cupric complexes 1 (1968) 521
Chidambaram, R. and S.K. Sikka, Bent O–H–––O hydrogen bonds in crystals 2 (1968) 162
Erratum 3 (1969) 118
Chien, J.C.W., see Ward 6 (1970) 245
Chilver, C.R. and F.K. Fong, Characteristic radiative decay lifetimes and symmetry distribution in KCl:Sm^{2+} 7 (1970) 229
Choi, J.H., C.F. Lebeda and R.P. Messmer, Variational principle for excited states: exact formulation and other extensions 5 (1970) 503
Chong, D.P., see Thorhallsson 4 (1969) 405
Chopin, C.M. and J.H. Wharton, The electronic excited states of indole: indirect evidence for excited 2H indole 3 (1969) 552
Chow, K.W., see Waggoner 3 (1969) 151
Chow, K. W. and A.L. Smith, Electronic excitation transfer between atomic and molecular hydrogen 7 (1970) 127
Chow, P., see Ware 2 (1968) 356
Christensen, D.H., see Cyvin 5 (1970) 597
Christie, J.H. and D.J. Lockwood, Electronic Raman spectrum of Co^{2+} in $CoCl_2$ 8 (1971) 120
Christie, J.H., see Lockwood 9 (1971) 559
Christodoulides, A.A., see Christophorou 3 (1969) 237, 363
Christoffersen, R.A. and K.A. Baker, Electron population analysis. Gross atomic charges in molecules 8 (1971) 4
Christoffersen, R.E. and G.M. Maggiora, Ab initio calculations on large molecules using molecular fragments. Preliminary investigations 3 (1969) 419
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Christophorou, L.G., see Wagner 4 (1969) 224
Christophorou, L.G., see Collins 4 (1970) 646
Christophorou, L.G., see Easterly 6 (1970) 579
Chu, S.Y., The relation between the geminal method and the multi-configuration SCF approach 7 (1970) 569
Chupka, W.A., see Berkowitz 7 (1970) 447
Chuvylkin, N.D., see Zhidomirov 10 (1971) 341
Ciach, S., G. Power and P. Thistlethwaite, The electronic absorption spectrum of the SeCl radical 9 (1971) 349
Čížek, J., see Sinanoğlu 1 (1967) 337
Čížek, J., see Paldus 3 (1969) 1
Clack, D.W., N.S. Hush and J.R. Yandle, The ESR spectra of metal phthalocyanine negative ions 1 (1967) 157
Claesson, S., see Fisher 9 (1971) 306, 309
Claridge, R.F.C., see Freeman 5 (1970) 555
Claridge, R.F.C., see Freeman 6 (1970) 482
Claridge, R.F.C., see Freeman 8 (1971) 77
Claridge, R.F.C., see Butchard 8 (1971) 139

Claridge R.F.C., see Freeman 8 (1971) 226
Claridge, R.F.C., see Freeman 9 (1971) 578
Claridge, R.F.C., see Freeman 10 (1971) 530
Clark, A. and H.M. Seip, The potential function for the CCC bending in carbon suboxide 6 (1970) 452
Clark, D.T. and D.M.J. Lilley, Molecular core binding energies for some five membered ring heterocycles as determined by X-ray photoelectron spectroscopy 9 (1971) 234
Clark, D.T. and D.B. Adams, Molecular core binding energies and multiplet splittings in $Cr(CO)_6$, $Cr(\pi C_5H_5)_2$ and $Cr(hfa)_3$ as determined by X-ray photoelectron spectroscopy 10 (1971) 121
Clark, I.D. and R.P. Wayne, The collisional deactivation of $C_2(^1\Delta_g)$ 3 (1969) 93
Clark, I.D. and R.P. Wayne, The reaction of $O_2(^1\Delta_g)$ with atomic nitrogen and with atomic oxygen 3 (1969) 405
Clark, I.D., Energy transfer from $O(^1D)$ to O_2 5 (1970) 317
Clark, M.G., Use of colour symmetry in the theory of additive properties of molecules and complexes 6 (1970) 558
Clarke, J.H.R., Raman spectra of lattice vibrations in liquid and solid monovalent metal nitrates 4 (1969) 39
Clarke, R.H., Magnetic resonance studies of optical spin polarization in triplet state anthracene 6 (1970) 413
Clausen III, C.A., R.A. Prados and M.L. Good, Nuclear isomer shift and ligand electronegativity in ruthenium trihalides 8 (1971) 565
Claverie, P., see Diner 2 (1968) 319
Claverie, P., see Huron 4 (1969) 429
Claverie, P., see Huron 9 (1971) 194
Claxton, T.A. and J. Oakes, "Variable" hyperfine coupling constants 1 (1967) 189
Claxton, T.A., see Blandamer 1 (1967) 203
Claxton, T.A., The cyanide radical 4 (1969) 469
Claxton, T.A., D. McWilliams and N.A. Smith, Ab initio UHF calculations of hyperfine coupling constants 4 (1970) 505
Clements, R.F. and M. Sharnoff, Photoselective determination of the magnetic axes of pyrazine 7 (1970) 4
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Clough, P.N., A.H. Curran and B.A. Thrush, The EPR spectrum of vibrationally excited OH radicals 7 (1970) 86
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Clyne, M.A.A., J.A. Coxon and H.W. Cruse, Electronic energy transfer to dissociated bromine by $O_2\,{}^1\Sigma_g^+, {}^1\Delta_g$ 6 (1970) 57
Clyne, M.A.A. and I.F. White, Electronic energy transfer processes in fluorine-containing radicals: singlet NF 6 (1970) 465
Cobb, T.B., see McIntyre 4 (1970) 585
Cocivera, M., Triplet energy transfer in solution studied by NMR spectroscopy 2 (1968) 529
Cocivera, M., see Tomkiewicz 8 (1971) 595
Cocivera, M., see Tomkiewicz 10 (1971) 39
Cohan, N.V., see Weissmann 1 (1967) 95
Cohan, N.V., see Weissmann 7 (1970) 445
Cohan, J.S. and N.F. Lane, Calculation of cross sections for Penning ionization: $He^*(2^1S, 2^3S) + H(1^2S)$ 10 (1971) 623
Cohen, M. and T. Feldmann, On a variational method for calculating excited-state wavefunctions 6 (1970) 43
Cohen, M., T. Feldmann and R.P. McEachran, A varational lower bound to the overlap for excited states 9 (1971) 498

Cohen, M., see Jackson 10 (1971) 143
Cohen, M.D., B.S. Green, Z. Ludmer and G.M.J. Schmidt, Excimer emission and photo-dimerization in a crystalline stilbene 7 (1970) 486
Colles, M.J., G.E. Walrafen and K.W. Wecht, Stimulated Raman spectra from H_2O, D_2O, HDO and solutions of $NaClO_4$ in H_2O and D_2O 4 (1970) 621
Erratum 5 (1970) 540
Collin, J.E., see Natalis 2 (1968) 79
Collin, J.E. and P. Natalis, Electronic states of the nitric oxide ion 2 (1968) 194
Collin, J.E., see Natalis 2 (1968) 414
Collin, J.E., see Natalis 9 (1971) 139
Collingwood, J.C., P. Day and R.G. Denning, Magnetic circular dichroism of the $^4A_2 \rightarrow {}^2E\,(^2D)$ transition in Cs_3CoCl_5 10 (1971) 274
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Collorec, R., see Moisan-Pellois 5 (1970) 299
Colter, A.K., see Ray 2 (1968) 324
Comeaux, A.R., see Vroom 3 (1969) 476
Comes, E.J. and F. Speier, The optical formation and the collisional deactivation of the first negative system of nitrogen 4 (1969) 13
Comes, F.J. and U. Wenning, Field pre-dissociation – a new phenomenon in molecular spectroscopy 5 (1970) 195
Comes, F.J. and U. Wenning, Predissociation induced by collisions and by external electric fields 5 (1970) 199
Compton, R.N., see Huebner 2 (1968) 407
Compton, R.N., see Nalley 9 (1971) 529
Connolly, J.W.D. and K.H. Johnson, Calculation of the ionization energies of the sulphur hexafluoride molecule by the multiple scattering method 10 (1971) 616
Connor, J.A., see Barber 9 (1971) 570
Connor, J.H., see Koskikallio 8 (1971) 467
Connor, J.N.L., On the semiclassical approximation for double well potentials 4 (1969) 419
Cook, D.B., see Hinchliffe 1 (1967) 217
Cook, D.B. and R. McWeeny, Approximation methods for all-electron calculations. The formaldehyde molecule 1 (1968) 588
Cook, D.B. and P. Palmieri, Approximate molecular wavefunctions for H_2S, PH_3, SiH_4 3 (1969) 219
Cook, D.B., A. Hinchliffe and P. Palmieri, "Mixed basis" calculation of hyperfine coupling constants 3 (1969) 223
Cook, D.B. and P.Th. van Duijnen, Molecular integrals in terms of ellipsoidal gaussian-type orbitals 8 (1971) 201
Cook, I.P., see Atherton 8 (1971) 187
Coope, J.A.R., A formal relation between valence bond and molecular orbital theory 1 (1967) 77
Coope, J.A.R., On the singularities of poly-crystalline spectra 3 (1969) 589
Erratum 4 (1969) 226
Coope, J.A.R., F.R. McCourt and H. Moraal, On the Senftleben effect for a dilute gas of $^2\Pi$ molecules 4 (1969) 84
Cooper, I.L., A note on the pairing theorem 2 (1968) 394
Cooper, W., Multiplet structure of aggregated states in 1,1′-diethyl-2,2′-cyanine dye 7 (1970) 73
Copland, G.M., Model calculation of the superexchange interaction in rare earth iron garnets 7 (1970) 175
Cornaz, P., see Hauser 5 (1970) 226

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Cornille, M. and J. Horsley, Ab initio calculation of the structure of the CO_3 molecule 6 (1970) 373
Corrigan, S.J.B., see Lempert 8 (1971) 67
Corrington, J.H., Representations of atomic virtual orbitals for use in semi-empirical molecular orbital calculations 5 (1970) 416
Corset, J., see Burneau 9 (1971) 99
Cotton, D.H., see Bulewicz 9 (1971) 467
Courtens, E., see Szöke 1 (1967) 87
Couzi, M., see Huong 7 (1970) 189
Cowsik, R.K., G. Rangarajan and R. Srinivasan, ESR study of coupled pairs of molecules in copper diethyldithiocarbamate 8 (1971) 136
Cox, A.P., see Whittle 9 (1971) 42
Cox, P.A. and F.A. Orchard, On band intensities in the photoelectron spectra of open-shell molecules 7 (1970) 273
Cox, P.A., S. Evans, A. Hamnett and A.F. Orchard, The helium-(I) photoelectron spectrum of vanadium tetrachloride 7 (1970) 414
Coxon, J.A., see Clyne 6 (1970) 57
Cradock, S., The photoelectron spectra of GeH_4 and GeF_4 10 (1971) 291
Craig, D.P. and E.A. Power, The asymptotic Casimir-Polder potential for an isotropic molecules 3 (1969) 195
Craig, D.P. and G. Fischer, The electronically excited states of NSF at 4000 Å and 5300 Å 4 (1969) 227
Craig, D.P., E.A. Power and T. Thirunamachandran, The interaction of optically active molecules 6 (1970) 211
Crawford, O. and A. Dalgarno, Bound states of an electron in a dipole field 1 (1967) 23
Crawford, O.H., see Dalgarno 2 (1968) 381
Crawford, O.H., Electron collision frequencies in water vapor 2 (1968) 461
Crawford, O.H., Rotational transitions in hydrogen gas when both collision partners rotate 6 (1970) 409
Creel, R.B., see Segel 2 (1968) 613
Creighton, J.R., see Gregg 8 (1971) 609
Cremaschi, P., see Polezzo 1 (1967) 357
Crofts, J.G., see Blackburn 7 (1970) 102
Crosby, G.A., see Klassen 1 (1967) 127
Crosby, G.A., see Watts 8 (1971) 49
Cross Jr., R.J. and C.J. Malerich, Scattering of high-energy alkali atoms 2 (1968) 481
Cross Jr., R.J., see Wartell 5 (1970) 477
Cruse, H.W., see Clyne 6 (1970) 57
Cudby, M., see Chantry 10 (1971) 473
Curran, A.H., see Clough 7 (1970) 86
Curran, A.H., R.G. Macdonald, A.J. Stone and B.A. Thrush, The electron paramagnetic resonance spectrum of NF ($^1\Delta$) in the gas phase 8 (1971) 451
Curtis, M.M., see Newman 3 (1969) 158
Curtis, M.M. and D.J. Newman, Power laws for lanthanide crystal field parameters 9 (1971) 606
Curtiss, C.F., see Roberts 2 (1968) 366
Cusachs, L.Ch. and P. Politzer, On the problem of defining the charge on an atom in a molecule 1 (1968) 529
Cusachs, L.C., see Politzer 2 (1968) 1
Cusachs, L.C., see Fogleman 3 (1969) 52

Cusachs, L.C., see Miller 3 (1969) 501
Cvetanović, R.J., see Paraskevopoulos 9 (1971) 603
Cyvin, B.N., S.J. Cyvin and G. Hagen, Condensed values of mean amplitudes of vibration 1 (1967) 211
Cyvin, B.N., see Cyvin 2 (1968) 341
Cyvin, S.J., see Cyvin 1 (1967) 211
Cyvin, S.J., see Brunvoll 1 (1968) 566
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Erratum 6 (1970) 552
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Dacre, P.D. and M. Elder, Gaussian expansions of orbital products for the evaluation of two-electron integrals 8 (1971) 625
Da-Fei Feng, see Fueki 4 (1969) 313
Dagg, I.R., C.F. Liu and G.E. Reesor, Absorption of CS_2 vapour in the microwave region 3 (1969) 377
Dahl, J.P., H. Johansen, D.R. Truax and T. Ziegler, On the derivation of necessary conditions on Hartree–Fock orbitals 6 (1970) 64
Dahler, J.S., see Yen Chu 8 (1971) 369
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Dalgarno, A., see Crawford 1 (1967) 23
Dalgarno, A., see Burke 1 (1967) 345
Dalgarno, A., O.H. Crawford and A.C. Allison, Low-energy electrons in polar gases 2 (1968) 381
Dalgarno, A. and G.W.F. Drake, Rayleigh–Schrödinger multiple perturbation theory 3 (1969) 349
Dalgarno, A., see Reid 6 (1970) 85
Dalgarno, A., C. Bottcher and G.A. Victor, Pseudo-potential calculation of atomic interactions 7 (1970) 265
Dalgarno, A., see Riley 9 (1971) 382
Dalgarno, A., see Weisheit 9 (1971) 517
Damany, N., see Roncin 3 (1969) 197
Damiani, D. and A.M. Mirri, Microwave rotational spectrum of 1-pentyne 10 (1971) 351
Daniels, M., see Hauswirth 10 (1971) 140
Danner, J.C., U. Ranon and D.N. Stamires, ESR of Mn^{2+} in ferroelectric $LiTaO_3$ and $LiNbO_3$ single crystals 2 (1968) 605

Danon, J., see Gomes 3 (1969) 167
Danon, J., see Gomes 4 (1969) 239
Danon, J., see Asch 5 (1970) 105
Danon, J., see Friedt 7 (1970) 603
Darmon, I., A. Gerschel and C. Brot, Far infrared absorption of liquid and gaseous carbonyl sulphide up to the critical region 7 (1970) 53
Darmon, I., A. Gerschel and C. Brot, Far infrared absorption in OCS and CS_2 up to the critical region 8 (1971) 454
Das Gupta, D., see Bhattacharyya 4 (1970) 541
Dattatreya Sastry, M., see Rao 2 (1968) 20
Dattatreya Sastry, M., see Lin 3 (1969) 244
Daudey, J.P. and A. Pullmann, Zero-field splitting parameters in heterocyclic molecules.III. Explicit configuration mixing and double perturbation treatment including doubly excited configurations 5 (1970) 347
Daudey, J.P., see Mantione 6 (1970) 93
Dave, J.V., see Abraham 8 (1971) 351
David, D.J., Correlated pseudo-potential approach for molecules 7 (1970) 577
Davidson, E.R., see Bender 3 (1969) 33
Davidson, E.R., see Nesbet 4 (1969) 203
Davidson, R., see Bell 5 (1970) 214
Davies, D.W., Ionization potentials by the CNDO/2 method 2 (1968) 173
Davies, M., see Chamberlain 1 (1968) 523
Davies, M. and J. Swain, Molecular conformation changes observed as dielectric absorptions 2 (1968) 42
Davies, M., G.W.F. Pardoe, J. Chamberlain and H.A. Gebbie, The character of the far infrared absorptions in non-polar liquids 2 (1968) 411
Davies, M., see Parry Jones 4 (1969) 33
Davies, M., see Gregson 6 (1970) 215
Davis, F.J. and D.R. Nelson, Pseudo-first-order attachment rates of thermal electrons by SF_6 in different carrier gases 3 (1969) 461
Davis, F.J. and D.R. Nelson, Attachment rate of thermal electrons to SF_6 6 (1970) 277
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Davison, S.G. and N.F. Taylor, Linear crystal energy bands via the many-neighbour approximation 3 (1969) 424
Davison, W.D., see Calvert 4 (1969) 327
Day, P. and Chr.K. Jørgensen, Electron transfer bands of hexachloro-iridate (IV) at 20°K 1 (1968) 507
Day, P., L. DiSipio and L. Oleari, Electronic transitions of permanganate and manganate ions in the near infrared 5 (1970) 533
Day, P., see Collingwood 10 (1971) 274
Dayan, E., see Chalaye 8 (1971) 337
Deakin, J.J., D. Husain and J.R. Wiesenfeld, Kinetic study of electronically excited iodine atoms, $I(5p^5\ ^2P_{1/2})$, by time-resolved atomic absorption $I(5p^4 6s(^2P_{3/2}) \leftarrow 5p^5(^2P^0{}_{1/2}))$ at $\lambda = 206.23$ mm 10 (1971) 146
De Alti, G. and V. Galasso, On the overlap population analysis in the SCCC MO method 8 (1971) 223
Dean, G.D. and D.H. Martin, Inter-molecular vibrations of crystalline polyethylene and long-chain paraffins 1 (1967) 415
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DeArmond, M.K., see Hillis 10 (1971) 325
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De Bie, M.J.A. and R. Braams, The free radicals in irradiated glycines. A comment 8 (1971) 208
De Boer, E., see Canters 1 (1968) 627
De Brouckère, G., see Trappeniers 8 (1971) 327
De Bruijn, S., Oscillator strength in alternant hydrocarbons 5 (1970) 428
De Bruijn, S., Pariser–Parr–Pople-theory: Linderberg's relation and empirical β-values 8 (1971) 19
Dedieu, A. and A. Veillard, Ab initio calculation of activation energy for an SN2 reaction 5 (1970) 328
Degenkolb, E.O., H. Mayfarth and J.I. Steinfeld, Laser-excited fluorescence of tellurium vapor 8 (1971) 288
De Giambiagi, M.S. and M. Giambiagi, Certain rules concerning alternant hydrocarbons 1 (1968) 563
De Groot, M.S., see Schmidt 1 (1967) 434
DeHaas, N., see Westenberg 7 (1970) 597
De Heer, F.J., H.R. Moustafa Moussa and M. Inokuti, Production of Lyman-α radiation in collisions of electrons on molecular hydrogen (0.05-3 keV) 1 (1967) 484
De Heer, F.J., see Aarts 4 (1969) 116
De Heer, F.J., see Fournier 9 (1971) 426
De Jeu, W.H., The calculation of overlap integrals between Slater-type orbitals with nearly equal exponents 5 (1970) 109
De Jeu, W.H., A CNDO calculation of the hydrogen bond and the blue shift in formaldehyde–water 7 (1970) 153
De Jong, J. and C. MacLean, Calculations on the zero-field splitting parameters of the phosphorescent triplet states of nitrogen containing aromatics 5 (1970) 424
Delacôte, G., see Devaux 2 (1968) 337
Delacôte, G., see Fourny 5 (1970) 495
Delacôte, G., see Tiberghien 8 (1971) 88
Delacôte, G., see Tiberghien 9 (1971) 642
Delacôte, G., see Ern 10 (1971) 287
De la Vega, J., see O'Sullivan 5 (1970) 576
De la Vega, J.R., see Fang 6 (1970) 117
Del Bene, J. and J.A. Pople, Intermolecular energies of small water polymers 4 (1969) 426
Del Bene, J.E., Low-energy electronic states of methylene 9 (1971) 68
De Leeuw, F.H. and A. Dymanus, Electric and magnetic properties of OCS measured by molecular-beam electric-resonance-spectroscopy 7 (1970) 288
De Lima, C.G., see De Araujo 7 (1970) 333
Dellepiane, G., see Gussoni 10 (1971) 559
De Lozé, D. and M.H. Baron, Infrared evidence for the structure of salt saturated aqueous solutions 9 (1971) 103
Delwiche, J., see Praet 5 (1970) 546
Delwiche, J. and P. Natalis, Photoelectron spectrometry of hydrogen sulphide 5 (1970) 564
Delwiche, J., see Natalis 9 (1971) 138
De Maré, G.R. and G.H. Huybrechts, Rate of recombination of trichloromethyl radicals in the gas phase 1 (1967) 64
De Maré, G.R., see Bertrand 5 (1970) 183
De Munno, A., see Bucci 1 (1967) 473
Demuynck, J., see Veillard 4 (1970) 476
Demuynck, J. and A. Veillard, Ab initio calculation of the electronic structure of the $CuCl_4^{2-}$ ion 6 (1970) 204
Demuynck, J., A. Veillard and G. Vinot, Ab initio calculation of the electronic structure of the $Ni(CN)_4^{2-}$ ion 10 (1971) 522

De Neef, T., see Koningsberger 4 (1970) 615
Den Hollander, J.A., R. Kaptein and P.A.T.M. Brand, Chemically induced dynamic nuclear polarization (CIDNP) VII. Photoreactions of aliphatic ketones 10 (1971) 430
Denison, A.B., see Sims 5 (1970) 370
Denning, R.G., see Collingwood 10 (1971) 274
Deopura, B.L. and V.D. Gupta, Small-angle X-ray scattering from polyethylene 9 (1971) 313
De Paz, M., A. Pozzo and M.E. Vallauri, Mass-spectrometric evidence against "polywater" 7 (1970) 23
Derflinger, G., A critical examination of the linear variation methods 1 (1967) 153
Derwent, R.G., D.R. Kearns and B.A. Thrush, The excitation of iodine by singlet molecular oxygen 6 (1970) 115
Derwent, R.G. and B.A. Thrush, The radiative lifetime of the metastable iodine atom $I(5^2P_{1/2})$ 9 (1971) 591
Desclaux, J.P., see Verhaegen 9 (1971) 479
Devaux, P. and G. Delacôte, Transfer integrals in metal-free phtalocyanine crystals 2 (1968) 337
Devaux, Ph., see Tiberghien 9 (1971) 642
De Villepin, J., see Lindgren 3 (1969) 84
Devillers, C., see Willis 2 (1968) 51
Devlin, J.P. and D.W. James, Raman spectra of rubidium nitrate: relationship between disordered solid phases and the molten state 7 (1970) 237
De Vos, E., see Bellemans 1 (1968) 639
De Vries, A.E., see Baede 3 (1969) 530
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Dhingra, M.M., G. Govil and C.R. Kanekar, Contact shifts and mechanism of spin delocalisation in hexa coordinated nickel complexes 10 (1971) 86
Dhingra, R.C. and J.A. Poole, Anomalous emission from some derivatives of azulene 2 (1968) 108
Diemann, E., see Müller 3 (1969) 467
Diemann, E., see Müller 9 (1971) 369
Diercksen, G.H.F., SCF MO LCGO studies on hydrogen bonding. The water dimer 4 (1969) 373
Diercksen, G.H.F., see Kraemer 5 (1970) 463
Diercksen, G.H.F. and W.P. Kraemer, SCF MO LCGO studies on hydrogen bonding. The system $(FHOH)^-$ 5 (1970) 570
Diercksen, G.H.F. and W.P. Kraemer, SCF MO LCGO studies on hydrogen bonding: the hydrogen fluoride dimer 6 (1970) 419
Dijkerman, H.A. and G. Ruitenberg, Determination of the dipole moment of OCS with a microwave absorption cavity 3 (1969) 172
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Diner, S., J.P. Malrieu, P. Claverie and F. Jordan, Fully localized bond orbitals and the correlation problem 2 (1968) 319
Dinse, K.-P., see Biehl 10 (1971) 605
DiSipio, L., see Day 5 (1970) 533
Distler, D. and G. Hohlneicher, Pairing properties in alternant hydrocarbons and the electronic spectra of pentacene dianion and pentacene dication 7 (1970) 345

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Dixon, M., see Clifford 1 (1967) 185
Dixon, R.N. and G. Duxbury, Doublet splittings in a non-rigid molecule 1 (1967) 330
Dixon, R.N. and S.E. Hull, The photo-ionization of π-electrons from O_2 3 (1969) 367
Dixon, R.N., see Barrow 4 (1970) 547
Dmitriev, Yu.Yu. and M.S. Yuriev, Variational principle for the correction of the third order energy in perturbation theory 4 (1969) 43
Dmitriev, Yu.Yu. and M.S. Yuriev, Variational upper and lower bounds for the correction of the second order energy in $1/Z$ expansions for two-electron atoms 4 (1969) 45
Doane, J.W. and D.L. Johnson, Spin–lattice relaxation in the nematic liquid crystalline phase 6 (1970) 291
Doemeny, L.J., F.J. van Itallie and R.M. Martin, Intramultiplet conversion in crossed molecular beams: $Hg(6^3P_2) + M \rightarrow Hg(6^3P_1) + M$ 4 (1969) 302
Dohman, H.D., see Bennewitz 8 (1971) 235
Dondi, M.G., see Cavallini 10 (1971) 22
Dong, P. and J. Durup, On the non-symmetry of the cross section for collision-induced excitation of HD^+ to the $2p\sigma_u$ state 5 (1970) 340
Erratum 7 (1970) 639
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Drake, G.W.F., see Dalgarno 3 (1969) 349
Drake, G.W.F., Perturbation theory applied to autoionizing states 5 (1970) 189
Drake, J. and R.W. Nicholls, The *r*-centroid approximation and molecular spectra 3 (1969) 457
Drake, J.E., see Frost 10 (1971) 347
Drauglis, E., see Kaplan 9 (1971) 645
Dreeskamp, H. and Chr. Schumann, Geminal coupling constants in group IV hydrides 1 (1968) 555
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Drent, E., see Nitzan 9 (1971) 273
Drost-Hansen, W., Thermal anomalies in aqueous systems: manifestations of interfacial phenomena 2 (1968) 647
Drowart, J., see Vander Auwera-Mahieu 1 (1967) 311
Drowart, J., see Vander Auwera-Mahieu 4 (1969) 198
Drowart, J., see Smoes 8 (1971) 10
Dua, S.S., see Gupta 4 (1967) 377
Dubois, M., P. Berge and C. Laj, Measurement of the diffusion coefficient of small molecules by means of quasi-elastic scattering of light 6 (1970) 277

Dubost, H., see Abouaf-Marguin 7 (1970) 61
Dubrin, J., see Felder 6 (1970) 385
Dufresne, A., see De Araújo 7 (1970) 333
Dugan, C.H., see Howard 8 (1971) 433
Dugan Jr., J.V., J.H. Rice and J.L. Magee, On the nature of ion–molecule collisions 2 (1968) 219
Dugan Jr., J.V., J.H. Rice and J.L. Magee, Evidence for long-lived ion–molecule collision complexes from numerical studies 3 (1969) 323
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Dugan Jr., J.V., Comparison of numerical capture cross sections with experimental reaction cross sections for $NH_3^+ + NH_3$ 8 (1971) 198
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Duke, A.J. and R.F.W. Bader, A Hartree–Fock SCF calculation of the activation energies for two SN_2 reactions 10 (1971) 631
Dunmur, D.A., Local field effects in oriented nematic liquid crystals 10 (1971) 49
Dunn, M.B., see Buckingham 3 (1969) 540
Dunning, T.H., see Hunt 3 (1969) 606
Dunning Jr., T.H., W.J. Hunt and W.A. Goddard III, The theoretical description of the ($\pi\pi^*$) excited states of ethylene 4 (1969) 147
Dunning Jr., T.H., see Goddard III 4 (1969) 231
Dunning Jr., T.H., see Hunt 6 (1970) 147
Dunning Jr., T.H., see Hosteny 7 (1970) 325
Dunning Jr., T.H., Gaussian basis functions for use in molecular calculations. Contraction of (12s9p) atomic basis sets for the second row atoms 7 (1970) 423
Dunning Jr., T.H., see Winter 8 (1971) 169
Du Plessis, L.S., N.P. Slabbert and D.A. Thornton, Anomalous features of N–H vibrational frequencies in complexes of zinc(II) with substituted anilines 1 (1967) 301
Durocher, G., see Ewald 5 (1970) 83
Durocher, G., see Ewald 8 (1971) 479
Durup, J., see Dông 5 (1970) 340
Durup, J., see Pham 7 (1970) 639
Duval, E., P. Rigny and G. Lepoutre, ^{23}Na and ^{14}N Knight shifts in concentrated solutions of sodium in ammonia 2 (1968) 237
Duxbury, G., see Dixon 1 (1967) 330
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Dwek, R.A., P.J. Caplan, E.H. Poindexter and J.A. Potenza, Dynamic nuclear polarization in phosphorous compounds at 74 Gauss 3 (1969) 283
Dwivedi, A.M. and V.D. Gupta, Infrared spectra of hexa-and dodeca-glycines 8 (1971) 220
Dyczmons, V., V. Staemmler and W. Kutzelnigg, Near Hartree–Fock energy and equilibrium geometry of CH_5^+ 5 (1970) 361
Dyer, G.L., see Golomb 5 (1970) 101
Dymanus, A., see Van Dijk 2 (1968) 235
Dymanus, A., see Van Dijk 4 (1969) 170
Dymanus, A., see Van Dijk 5 (1970) 387
Dymanus, A., see De Leeuw 7 (1970) 288
Dymond, J.H. and B.J. Alder, Pair and non-pair argon potential 2 (1968) 54

Eachus, R.S. and F.G. Herring, ESR evidence for the formation of Cd(I) in irradiated $CaCd(OOCCH_3)_4 \cdot 6H_2O$ 5 (1970) 405
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Eaton, C.R., see Brion 3 (1969) 600
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Ebisuzaki, Y. and M. Nicol, Raman spectrum of ammonium chloride at high pressures 3 (1969) 480
Eckhart, C.J. and G.D. Sturgeon, Specular reflection and absorption edges of xenon difluoride single crystals in the near ultraviolet 8 (1971) 300
Eckhardt, C.J. and R.R. Pennelly, Metallic reflection of the TCNQ molecular crystal 9 (1971) 572
Eda, B., see Iwasaki 2 (1968) 210
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Edqvist, O., see Åsbrink 5 (1970) 192, 609
Edwards, T.G. and R. McWeeny, Magnetic properties of conjugated molecules 10 (1971) 283
Egawa, A., see Nakato 9 (1971) 615
Egawa, K., N. Nakashima, N. Mataga and Ch. Yamanaka, Time-resolved fluorescence spectra of *s*-tetracyanobenzenetoluene complex 8 (1971) 108
Eggers, J.H., see Thulstrup 1 (1968) 690
Eggers, J.H., see Thulstrup 7 (1970) 31
Ehrenberg, L., see Blinc 9 (1971) 85
Ehrenson, S., An examination of hydrogen exchange in CH_5^+ by the CNDO method 3 (1969) 585
Ehrenson, S., see Weston Jr. 9 (1971) 351
Ehrenson, S., Weighted small gaussian expansions of Slater-type atomic orbitals 9 (1971) 521
Ehrlich, B.S. and M. Kaplan, Chemical bonding in SnI_4 3 (1969) 161
Eisenthal, K.B., Measurement of intermolecular energy transfer using picosecond light pulses 6 (1970) 155
Eisenthal, K.B. and J.E. Rieckhoff, Induced birefringence as a method for studying the electronic transitions and polarizability of molecules in excited electronic states 6 (1970) 441
Erratum 7 (1970) 639
Eisenthal, K.B., see Rehm 9 (1971) 387
Elder, M., see Dacre 8 (1971) 625
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Ellis, E., Crystal field spectra of rare earth salts in the far infrared (10–50 cm^{-1}) 1 (1967) 80
Ellison, F.O. and F.M. Matheu, Generalization of Dewar's half-electron method for calculating energies of open-shell electronic states 10 (1971) 322
Ellison, F.O. and L.L. Larcom, ESCA: a new semi-empirical correlation between core-electron binding energy and valence-electron density 10 (1971) 580
El Saffar, Z.M., see O'Reilly 8 (1971) 470
El-Sayed, M.A., D.S. Tinti and D.V. Owens, Spectroscopic determination of the most probable intersystem crossing route in phosphorescing molecules 3 (1969) 339
El-Sayed, M.A., see Tinti 3 (1969) 343
El-Sayed, M.A., see Harris 4 (1969) 409

El-Sayed, M.A., see Kuan 4 (1970) 507
El-Sayed, M.A., D.V. Owens and D.S. Tinti, Polarized modulated PMDR spectroscopy and the zero-field origin of phosphorescence 6 (1970) 395
El-Sayed, M.A., see Gwaiz 9 (1971) 454
El-Sayed, M.A., see Chen 10 (1971) 307
El-Sayed, M.A. and C.R. Chen, The intersystem crossing process in symmetric tetrachlorobenzene 10 (1971) 313
El-Sherbini, Th. M., see Van der Wiel 7 (1970) 161
Elvebredd, I., see Brunvoll 1 (1968) 566
Elvebredd, I., see Cyvin 2 (1968) 556
Emeis, C.A. and L.J. Oosterhoff, Emission of circularly-polarized radiation by optically-active compounds 1 (1967) 129, 269
Emschwiller, G. and Ch.K. Jørgensen, Electron transfer bands of binuclear iron (II, III) complexes containing two cyanide bridges 5 (1970) 561
Endo, K., see Morishima 9 (1971) 143, 203
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Epstein, I.R., Calculation of molecular integrals in momentum space 9 (1971) 9
Epstein, J.H., S.T. Epstein and C.M. Rosenthal, An extension of the delta-function model of H_2^+ – a possible laboratory for studying theories of exchange forces 6 (1970) 551
Epstein, S.T., see Johnson 1 (1968) 599
Epstein, S.T. and R.E. Johnson, The application of perturbation theories for exchange forces to a simple model 1 (1968) 602
Epstein, S.T., see Certain 4 (1969) 401
Epstein, S.T., see Epstein 6 (1970) 551
Ern, V., J.L. Saint-Clair, M. Schott and G. Delacôte, Effects of exciton interactions on the fluorescence yield of crystalline tetracene 10 (1971) 287
Etters, R.D., see Raich 6 (1970) 491
Evans, E.L., see Bach 10 (1971) 547
Evans, E.W., see Mandl 5 (1970) 307
Evans, S., J.C. Green, A.F. Orchard, T. Saito and D.W. Turner, The photoelectron spectrumm of vanadium hexacarbonyl 4 (1969) 361
Evans, S., see Cox 7 (1970) 414
Evarestov, R.A., see Adamov 3 (1969) 726
Evarestov, R.A., see Adamov 9 (1971) 465
Evleth, E.M., Ionic and biradical mechanisms in thermal and photo *cis–trans* isomerisations 3 (1969) 122
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Ewing, G.E., see Long 9 (1971) 225
Exarhos, G.J., and W.M. Risen Jr., Vibrational motion of cations in ionic glasses 10 (1971) 484

Fabes, L., see Gee 7 (1970) 311
Fahlman, A., see Hamrin 1 (1968) 557, 613
Fair, H.D., see Sharma 9 (1971) 564
Fajans, K. and O. Johnson, The electronic structure of the fluorine molecule 9 (1971) 95
Erratum 10 (1971) 492

Fang, Y. and J.R. de la Vega, Calculation of the proton transfer between water molecules 6 (1970) 117
Fankhauser, H.R., see Bazley 7 (1970) 121
Farrar, T.C., see Rush 2 (1968) 621
Faure, J., see Bonneau 2 (1968) 65
Fehsenfeld, F.C., E.E. Ferguson and M. Mosesman, Measurement of the thermal energy reaction $NO_2^+ + NO \rightarrow NO^+ + NO_2$ 4 (1969) 73
Felder, W., N. Sbar and J. Dubrin, A study of the reaction $N_2^+ + D_2O \rightarrow N_2D^+ + OD$ 6 (1970) 385
Feldmann, T., see Cohen 6 (1970) 43
Feldmann, T., see Cohen 9 (1971) 498
Felenbok, P., see Czarny 2 (1968) 533
Fels, M.F., see Hazi 8 (1971) 582
Felsteiner, J., Electric dipole–dipole interaction in NaSH 2 (1968) 397
Feng, D.-F., see Fueki 10 (1971) 504
Ferguson, E.E., see Fehsenfeld 4 (1969) 73
Ferguson, J. and P.E. Fielding, The origins of the colours of yellow, green and blue sapphires 10 (1971) 262
Ferreira, R., Atomic orbital energy matching in doubly occupied molecular orbitals 2 (1968) 233
Ferrell, J.R., G.R. Holdren Jr., R.V. Lloyd and D.E. Wood, EPR spectrum of X-irradiated adamantane: the 2-adamantyl free radical 9 (1971) 343
Ferroni, E., see Burlamacchi 9 (1971) 420
Fielding, P.E., see Ferguson 10 (1971) 262
Filseth, S.V., see Welge 10 (1971) 13
Findlay, F.D., C.J. Fortin and D.R. Snelling, Deactivation of $O_2(^1\Delta_g)$ 3 (1969) 204
Fink, E.H., D.L. Akins and C.B. Moore, Relative line intensities in the Lyman bands of HD 4 (1969) 283
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Fink, M., see Bonham 4 (1969) 349
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Fischer, E., G. Fischer and G. Stein, Temperature dependence of radiation induced *trans* → *cis* isomerization of stilbene in toluene 2 (1968) 405
Fischer, E., see Klueger 8 (1971) 279
Fischer, E., see Gegiou 10 (1971) 99
Fischer, G., see Fischer 2 (1968) 405
Fischer, G., see Craig 4 (1969) 227
Fischer, H., On electron and nuclear spin state populations during radical formation, combination, disproportionation and transfer reactions 4 (1970) 611
Fischer, P.H.H., see Charles 1 (1967) 451
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Fischer, R.D., see Von Ammon 4 (1970) 553
Fischer, S., Energy dependence of radiationless transitions 4 (1969) 333
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Fisher, E.R. and G.K. Smith, Vibrational relaxation by metal atoms 6 (1970) 438

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Fisher, M., G. Rämme, S. Claesson and M. Szwarc, Collapse of e^-, Na^+ pairs into sodium atoms and the reactions of solvated electrons and of e_r^-, Na^+ pairs 9 (1971) 309
Fitzsimmons, B.W. and C.E. Johnson, The Mossbauer spectrum of Fe $acac_2Cl$ in strong magnetic fields at 4°K; evidence for magnetic dimerisation 6 (1970) 267
Flax, L., see Raich 6 (1970) 491
Fleming, J.W., see Chantry 10 (1971) 473
Flint, C.D., The temperature dependence of the luminescence of some chromium (III) complexes 2 (1968) 661
Flouquet, F., see Horsley 5 (1970) 165
Flournoy, J.M. and L.Y. Nelson, Vibrational excitation of HCN 6 (1970) 521
Flygare, W.H., see Shoemaker 2 (1968) 610
Flygare, W.H., see Benson 4 (1969) 141
Flygare, W.H., see Hsu 4 (1969) 317
Flygare, W.H., see Shoemaker 6 (1970) 576
Flygare, W.H., see Kukolich 7 (1970) 43
Flygare, W.H., see Tigelaar 7 (1970) 254
Flygare, W.H., see Norris 10 (1971) 75
Flynn, G.W., see Bates Jr. 8 (1971) 103
Fogleman, W.W., L.C. Cusachs and H.B. Jonassen, Bonding in trimethylphosphino-allylnickel(II) chloride 3 (1969) 52
Foglia, C., see Buluggiu 1 (1967) 82
Foglia, C., Formation of dimers of hydrocarbons in the vapour phase 1 (1968) 669
Folland, R., see Boden 10 (1971) 167
Fong, F.K., see Chilver 7 (1970) 229
Fong, F.K. and M.M. Miller, Multiphonon decay of excited states of rare earth ions in crystals 10 (1971) 408
Formosinho, S.J., G. Porter and M.A. West, Vibrational relaxation following intersystem crossing 6 (1970) 7
Forsén, S. and B. Roos, MO SCF studies of the protonation of carbon monoxide and the nitrogen molecule using gaussian basis sets 6 (1970) 128
Forst, W., Rapid calculation of theoretical second-order unimolecular rate constant 1 (1968) 687
Forst, W., see Le-Khac Huy 3 (1969) 307
Forst, W., see Huy 9 (1971) 476
Förster, Th. and K. Rokos, A deuterium isotope solvent effect on fluorescence 1 (1967) 279
Försterling, H.D., see Czikkely 6 (1970) 11, 207
Fortin, C.J., see Findlay 3 (1969) 204
Fournier, J.T., see Robinson 3 (1969) 517
Fournier, P., C.A. van de Runstraat, T.R. Govers, J. Schopman, F.J. de Heer and J. Los, Collision-induced dissociation of 10 keV N_2^+ ions: evidence for predissociation of the $C^2\Sigma_u^+$ state 9 (1971) 426
Fournier, R.P., see Savoie 7 (1970) 1
Fourny, J. and G. Delacôte, Comparison of high and zero magnetic field values of non radiative triplet–triplet annihilation rate constants in crystalline anthracene 5 (1970) 495
Fox, M.F., see Blandamer 1 (1967) 203
Frame, H.D., An empirical correlation between chemical shift and xenon-129 coupling in xenon fluorides 3 (1969) 182
Franchini, P.F., see Bucci 8 (1971) 421

Francis, A.H. and C.B. Harris, The relationship between microwave spectroscopy, coherent triplet excitons, and density of states functions in molecular crystals 9 (1971) 181
Francis, A.H. and C.B. Harris, The observation of coherent triplet excitons and density of states functions in molecular crystals 9 (1971) 188
Francis, P.D. and G.R. Luckhurst, Electron resonance in the smectic mesophase 3 (1969) 213
Franklin, J.A., see Le-Khac Huy 3 (1969) 307
Fratev, F., see Tyutyulkov 4 (1969) 9
Freed, K.F., Geometry and barriers to internal rotation in Hartree–Fock theory 2 (1968) 255
Freed, K.F., Many-body perturbation theory and the variational pairs of quantum chemistry 4 (1970) 496
Freed, K.F., see Gelbart 6 (1970) 345
Freed, K.F. and H.P. Gillis, Self consistent field theories of the polymer excluded volume problem. II. Reiss' variational approach 8 (1971) 384
Freed, K.F. and W.M. Gelbart, On the Born–Oppenheimer separation and the calculation of nonradiative transition rates 10 (1971) 187
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Freeman, D.E., Extremal force constants in the cubic secular equation for molecular vibrations 2 (1968) 615
Freeman, D.E., On a new method for the calculation of dipole moment derivatives from infrared intensities 4 (1969) 165
Freeman, D.E., Extremal off-diagonal force constants for molecular vibrations 8 (1971) 271
Freeman, G.R., Kinetics of electron attachment reactions 8 (1971) 241
French, K.W., see Heller 10 (1971) 127
French, K.W., see Haugsjaa 10 (1971) 130
Freund, I., Harmonic scattering and critical point correlations in NH_4Cl 1 (1968) 551
Erratum 2 (1968) 126
Freund, R.S., Electron-impact dissociation of H_2O and D_2O into metastable fragments 9 (1971) 135
Friedman, H.A., see Nugent 7 (1970) 179
Friedmann, H. and U. Landman, Treatment of deviation from symmetry using generalized perturbation theory 1 (1967) 477
Friedt, J.M., see Asch 5 (1970) 105
Friedt, J.M., E. Baggio-Saitovitch and J. Danon, On the mechanism of formation of anomalous charge states of iron after ^{57}Co electron capture in Co complexes 7 (1970) 603
Friedt, J.M., see Llabador 8 (1971) 592
Fries, S.F., see Airey 8 (1971) 23
Froben, F.W., see Bubert 8 (1971) 242
Froines, J.R. and P.J. Hagerman, Luminescence of paracyclophanes I. *Syn-* and *anti-*[2.2] paracyclonaphthane 4 (1969) 135
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Frost, D.C., see Boyd 1 (1968) 649
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Frost, D.C., see Cornford 5 (1970) 486
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Fueki, K., see Noda 8 (1971) 407
Fueki, K., D.-F. Feng and L. Kevan, A semi-continuum model for the solvated electron in methanol 10 (1971) 504
Fuess, H., see Patscheke 2 (1968) 47
Fullerton, D.C., see Moran 2 (1968) 625
Fullerton, D.C. and T.F. Moran, Phase space model for $He^+ + N_2$ reactions: consideration of dispersion and short range forces 10 (1971) 626
Funck, Th., see Schuster 2 (1968) 587
Fung, B.M., see Olympia Jr. 6 (1970) 87
Furlani, C., see Candori 5 (1970) 153
Futrelle, R.P. and D.A. McQuarrie, Upper and lower bounds in quantum mechanical perturbation theory using linear programming 2 (1968) 223
Fyfe, C.A. and C.A. McDowell, Molecular motion in solid tropylium salts 2 (1968) 170
Fyfe, C.A., D.F.R. Gilson and K.H. Thompson, Molecular motion in solid pyrene 5 (1970) 215

Galabov, B. and D.Simov, The stretching vibrations of carbonyl groups in cyclic ketones 5 (1970) 549
Galasso, V., see de Alti 8 (1971) 223
Galatry, L., see Robert 1 (1967) 399
Galatry, L., see Robert 1 (1968) 526
Galatry, L., see Robert 3 (1969) 102
Galatry, L. and D. Robert, The orientational quantum state of hydrogenchloride gas dissolved in liquid sulphur hexafluoride 5 (1970) 120
Gallinaro, G., see Cavallini 7 (1970) 303
Gallivan, J.B. and J.S. Brinen, Solvent reordering of low lying triplet states in some aromatic carbonyls 10 (1971) 455
Gamba, A., G. Morosi and M. Simonetta, An investigation of the geometry of the CH_5^+ ion by the CNDO method 3 (1969) 20
Gamss, L.A., see Lee 7 (1970) 463
Gandhi, J.M., see Saksena 1 (1967) 424
Gangi, R.A., see Bader 6 (1970) 312

Ganiel, U., On the quadrupole splitting in ferrous compounds 4 (1969) 87
Gans, P., Force constant computations, part 1: external force constant relationships in the general secular equations for molecular vibrations 6 (1970) 561
Erratum 7 (1970) 396
Gardner, P.R., see Cameron 4 (1969) 229
Gardner, Ph.J., Intramolecular interactions involving the first excited singlet state of sulphur dioxide 4 (1969) 167
Garg, A.N., P.N. Shukla and P.S. Goel, Mössbauer spectra of tris(acetoacetanilide) iron(III) 7 (1970) 494
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Garg, K.B., see Nigam 2 (1968) 121
Garg, K.B., see Nigam 3 (1969) 398
Garland, W., see Brown 7 (1970) 461
Garrett, W.R., Critical binding of an electron to a non-stationary electric dipole 5 (1970) 393
Gaspard, F., see Brière 1 (1968) 706
Gaspard, F., see Brière 7 (1970) 537
Gaspard, F., see Brière 9 (1971) 285
Gasser, R.P.H. and E.B. Smith, A surface mobility parameter for chemisorption 1 (1967) 457
Gauthier, M. and D.R. Snelling, Formation of singlet molecular oxygen from the ozone photochemical system 5 (1970) 93
Gauthier, M., see Snelling 9 (1971) 254
Gaydaenko, V.I. and V.K. Nikulin, Born–Mayer interatomic potential for atoms with $Z = 2$ to $Z = 36$ 7 (1970) 360
Gebbie, H.A., see Chamberlain 1 (1968) 523
Gebbie, H.A., see Davies 2 (1968) 411
Gebbie, H.A., see Lassier 3 (1969) 96
Gee, D.R., L. Fabes and J.K.S. Wan, ESR spectra of γ-irradiated adamantane 7 (1970) 311
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Gelbart, W.M., see Freed 10 (1971) 187
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Geldof, P.A., see Werkhoven 9 (1971) 6
Geldof, P.A., R.P.H. Rettschnick and G.J. Hoytink, Vibronic coupling and radiative transitions 10 (1971) 549
Gelius, U., see Hamrin 1 (1968) 613
Gelius, U., B. Roos and P. Siegbahn, Ab initio MO SCF calculations of ESCA shifts in sulphur-containing molecules 4 (1970) 471
Gellai, B., see Jancsó 7 (1970) 314
Gelus, M., see Kutzelnigg 7 (1970) 296
Gelus, M., R. Ahlrichs, V. Staemmler and W. Kutzelnigg, Origin of the dimerization energy of BH_3 to B_2H_6 7 (1970) 503
Gengenbach, R., see Bennewitz 3 (1969) 374
Gensel, P., see Kompa 3 (1969) 210
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Gensel, P., K.L. Kompa and J. Wanner, Flash characteristics as an important parameter in chemical laser experiments 7 (1970) 583
George, M.V., see Gupta 1 (1967) 377
Georghiou, S., see Birks 1 (1967) 355
Gerhardt, G.E., see Brinen 5 (1970) 150
Gerlach, E., On non-local effects in van der Waals forces between metals 3 (1969) 669
Gerlach, E., see Büttner 5 (1970) 91
Gerry, M.C.L., see Holt 9 (1971) 621
Gerschel, A., see Darmon 7 (1970) 53
Gerschel, A., see Darmon 8 (1971) 454
Gersh, M.E. and R.B. Bernstein, Calculated total elastic scattering cross sections for H(1S) + H(1S) at collision energies below 1 eV 4 (1969) 221
Gershgorn, Z., Isomerization by absorption of radiation 7 (1970) 557
Gesser, H.D., see Singh 2 (1968) 271
Giacometti, G., see Nordio 1 (1967) 101
Giacometti, G., see Paladino 5 (1970) 15
Giambiagi, M., see De Giambiagi 1 (1968) 563
Gianturco, F.A., see Taylor 4 (1969) 376
Gianturco, F.A. and U. Lamanna, Preferential orientations for vibrational–translational energy transfer 6 (1970) 326
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Erratum 5 (1970) 622
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Giling, L.J., see Kloosterboer 8 (1971) 462
Gill, D., see Klein 2 (1968) 677
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Gill, D., see Rimai 10 (1971) 207
Gillard, I.R., see Blackburn 7 (1970) 102
Gillen, K.T. and R.B. Bernstein, Surface ionization detector sensitive to degree of internal excitation of alkali halides in molecular beams 5 (1970) 275
Gillies, E. and M.C. Baird, Paramagnetic metal ion-induced spin–spin decoupling in coordinated ligands 7 (1970) 451
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Gillis, H.A., see Walker 10 (1971) 636
Gillis, H.P., see Freed 8 (1971) 384
Gilman, R.R.,see Pipano 5 (1970) 285
Gilman, R.R., see Hosteny 7 (1970) 325
Gilson, D.F.R., see Fyfe 5 (1970) 215
Gilman, R.R., see Pipano 4 (1970) 583
Girardet, C., see Robert 3 (1969) 102

Giraud, M. and D. Robert, Molecular collision cross section due to angular dependent part in London dispersion forces 2 (1968) 551
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Glasbeek, M., see Lagendijk 6 (1970) 152
Glasbeek, M., F.M. Mourits and J.D.W. van Voorst, Anomalous shifts of solvent proton lines of solutions containing aromatic negative ions 8 (1971) 372
Glasser, M.L., see Kaplan 4 (1969) 103
Gleiter, R., see Jordan 10 (1971) 572
Gluck, P., The friction constant of an anharmonic solid 1 (1967) 91
Gochev, A., see Tyutyulkov 4 (1969) 9
Goddard III, W.A., see Kahn 2 (1968) 667
Goddard III, W.A., see Hunt 3 (1969) 414, 606
Goddard III, W.A., see Dunning Jr. 4 (1969) 147
Goddard III, W.A., T.H. Dunning Jr. and W.J. Hunt, The proper treatment of off-diagonal Lagrange multipliers and coupling operators in self-consistent field equations 4 (1969) 231
Goddard III, W.A., see Wilson Jr. 5 (1970) 45
Goddard III, W.A., see Blint 5 (1970) 302
Goddard III, W.A., see Hunt 6 (1970) 147
Goddard III, W.A., see Hay 9 (1971) 356
Godfrey, T.S., J.W. Hilpern and G. Porter, Triplet–triplet absorption spectra of benzophenone and its derivatives 1 (1967) 490
Godoy, J., see Grimm 6 (1970) 336
Goedicke, Ch., see Klueger 8 (1971) 279
Goel, P.S., see Garg 7 (1970) 494
Goggins, A.E., see Adams 1 (1967) 48
Goldberg, I.B. and A.J. Bard, Anomalous *g*-factors in the diphenylacetylene and diphenyldiacetylene anion radicals 7 (1970) 139
Golde, M.F. and B.A. Thrush, Vacuum ultraviolet emission by active nitrogen 8 (1971) 375
Golde, M.F., see Campbell 8 (1971) 612
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Goldschmidt, C.R., see Potashnik 9 (1971) 424
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Good, M.L., see Clausen III 8 (1971) 565
Good Jr., R.H., see Syme 2 (1968) 132
Goodall, D.M. and R.C. Greenhow, Ionization of water induced by vibrational excitation using a neodymium: glass laser 9 (1971) 583
Goodman, B.A., N.N. Greenwood and G.E. Turner, The effect of unresolved quadrupole splitting of the observed peak position in Mössbauer spectroscopy 5 (1970) 181
Goodman, L., see Zwarich 7 (1970) 609
Goodman, L., see Koyanagi 9 (1971) 74, 636
Goold, C.M., see Adams 1 (1967) 48
Gora, T.F., see Sharma 9 (1971) 564
Gorden Jr., R., see Sieck 10 (1971) 502
Gordon, R.G., see Agrawal 2 (1968) 584
Gornostansky, S., see Valic 9 (1971) 362
Gorobchenko, V.D., see Dészi 2 (1968) 665
Goscinski, O. and E. Brändas, Dispersion forces, second- and third-order energies 2 (1968) 299
Goscinski, O. and B. Lukman, Moment-conserving decoupling of Green functions via Padé approximants 7 (1970) 573
Goscinski, O., Density of states in narrow energy bands 9 (1971) 293
Goudmand, P., see Vidal 5 (1970) 398
Gouterman, M., see Smith 2 (1968) 517
Gouterman, M. and P. Sayer, Sigma bond triplet excimers 8 (1971) 126
Govers, T.R., see Fournier 9 (1971) 426
Govil, G., see Dhingra 10 (1971) 86
Govindarajan, J., see Haridasan 4 (1969) 11
Grabowska, A., Triplet states of six-membered N-heterocycles. Spin–orbital coupling in diazines 1 (1967) 113
Grabowska, A. and B. Pakuła, Triplet states of six-membered N-heterocycles: phosphorescence of pyrazine and its two conjugate acids 1 (1967) 369
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Graf, F. and Hs.H. Günthard, The penta-bromocyclopentadienyl radical 8 (1971) 395
Graham, C., see Buckingham 8 (1971) 622
Gränicher, H., see Blinc 4 (1969) 363
Grasdalen. H. and I. Svare, Proton relaxation in water and ethanol solutions of copper acetate 3 (1969) 452
Gratch, S., see Biscar 2 (1968) 435
Gray, C.G., Pressure-broadening of the rotational Raman lines of HCl 8 (1971) 527
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Gray, G.D., see Bell 5 (1970) 214
Gray, H.B., see Schugar 6 (1970) 26
Gray, H.B., see Sohn 6 (1970) 499
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Gray, J. and R.H. Tomlinson, Molecular beam studies of HeH and H_3 molecules 4 (1969) 251
Green, B.S., see Cohen 7 (1970) 486
Green, J.C., see Evans 4 (1969) 361
Greenawalt, E.M., see Browne 7 (1970) 363
Greenhow, R.C., see Goodall 9 (1971) 583
Greenleaf, J.R., see Vander Donckt 2 (1968) 409
Greenwood, N.N., see Goodman 5 (1970) 181
Gregg, D.W., B. Krawetz, R.K. Pearson, B.R. Schleicher, S.J. Thomas, E.B. Huss, K.J. Pettipiece, J.R. Creighton, R.E. Niver and Y.-L. Pan, Electron beam and flashlamp initiation of a pulsed hydrogen fluoride chemical laser 8 (1971) 609

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Griffin, R.G., see Pedersen 5 (1970) 373
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Grivet, J.-Ph., Electron spin resonance of the phosphorescent anthracene 4 (1969) 104
Groen, A., see Tomkiewicz 10 (1971) 39
Groff, R.P., see Merrifield 3 (1969) 155, 728
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Gronau, B., see Rapp 8 (1971) 529
Grosser, A.E., see Kalos 6 (1970) 537
Grosser, J. and H. Haberland, Reactive scattering of hydrogen and deuterium atoms from halogen molecules 7 (1970) 442
Groth, W., see Buschmann 2 (1968) 245
Groth, W., see Becker 6 (1970) 583
Groth, W., see Becker 8 (1971) 259
Grunberg, P., see Koningstein 6 (1970) 320
Grunberg, P., see Azima 7 (1970) 565
Gruninger, J. and H.F. Hameka, Calculation of magnetic shielding constants of the LiH molecule 1 (1967) 14
Grzywacz, J., see Birks 1 (1967) 187
Guidotti, C., see Arrighini 6 (1970) 435
Guidotti, C., see Gianturco 9 (1971) 539
Guidotti, C., see Gianturco 10 (1971) 269
Günthard, Hs. H., see Graf 7 (1970) 25
Günthard, Hs.H., see Graf 8 (1971) 395
Gupta, A.K., see Gupta 6 (1970) 317
Gupta, G.P., see Saxena 4 (1969) 291
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Gupta, M.P., see Mathur 3 (1969) 191
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Gupta, V.D., see Krishnan 6 (1970) 231
Gupta, V.D., A.K. Gupta and M.V. Krishnan, Vibrational properties of polyglycine chain 6 (1970) 317
Gupta, V.D., see Krishnan 7 (1970) 285
Gupta, V.D., R.D. Singh and D. Balasubramaniam, Amide bands in cyclic tetra-L-alanine 7 (1970) 500
Gupta, V.D., see Dwivedi 8 (1971) 220
Gupta, V.D., see Singh 8 (1971) 294
Gupta, V.D., see Deopura 9 (1971) 313
Gurd, R.C., see Atkins 8 (1971) 55
Guseva, L.N., see Kuzmin 3 (1969) 71
Gussoni, M. and G. Zerbi, Redundant coordinates in the harmonic approximation 2 (1968) 145
Gussoni, M. and G. Dellepiane, On the evaluation of cartesian symmetry coordinates in molecular vibrations 10 (1971) 559
Gutfreund, H. and W.A. Little, Existence of plasmons in large π-electron systems 2 (1968) 589
Guzzo, A.V., see Sims 5 (1970) 370
Gwaiz, A.A., M.A. El-Sayed and D.S. Tinti, Assignment of the lowest triplet state of benzene using phosphorescence-microwave double resonance (PMDR) techniques 9 (1971) 454

Haas, W.J., see Syme 2 (1968) 132
Haas, Y. and G. Stein, On a new fluorescence emission band in Eu(III) solutions in light and heavy water and in methyl cyanide 3 (1969) 313
Haas, Y. and G. Stein, Pathways of radiative and radiationless transitions in Eu^{3+} solutions: anti-Stokes emission 8 (1971) 366
Haber, G.A., see Chen 2 (1968) 483
Haberland, H., see Grosser 7 (1970) 442
Hadley Jr., J.H. and F.H. Hsu, Positron annihilation in irradiated acetyl methionine 7 (1970) 465
Hadley, S.G., Intersystem crossing quantum yield of quinoxaline; evidence for high yield of internal conversion of the first excited singlet state to the ground state 6 (1970) 549
Hadži, D., see Ažman 5 (1970) 157
Hadži, D., see Lavrenčič 5 (1970) 441
Haensel, R., E.E. Koch, N. Kosuch, U. Nielsen and M. Skobowski, Vacuum ultra-violet reflectivity of solid nitrogen and oxygen 9 (1971) 548
Haerten, R., see Bennewitz 9 (1971) 19
Haerten, R., see Bennewitz 3 (1969) 374
Hagen, G., see Cyvin 1 (1967) 211
Hagen, G., see Brunvoll 1 (1968) 566
Hagen, G., see Cyvin 1 (1968) 645
Hagen, G., see Cyvin 2 (1968) 341
Hagen, G., see Cyvin 2 (1968) 556
Hagerman, P.J., see Froines 4 (1969) 135
Häggström, L., see Wäppling 2 (1968) 160
Häggström, L., R. Wäppling and H. Annersten, Mossbauer study of ion-rich biotites s 4 (1969) 107
Hagopian, A.K.E., J.M. Marrs and A.U. Khan, Artifacts in emission spectral studies by the Cary 14 spectrophotometer, Corrigendum in the proposed singlet molecular oxygen emission from a tungsten lamp 9 (1971) 609
Hahn, H.-S. and E.A. Mason, Random-phase approximation for transport cross sections 9 (1971) 633
Hains, P.J., see Williams 10 (1971) 585
Håland, K., see Pedersen 2 (1968) 61

Halevi, E.A., E.N. Haran and B. Ravid, Dipole moment and polarizability differences between NH_3 and ND_3 1 (1967) 475
Halgren, T.A., R.J. Anderson, D.S. Jones and W.N. Lipscomb, X-ray studies of bonding electrons. Corrections for bonds to hydrogen upon extension of the basis sets 8 (1971) 547
Hall, G.G. and A. Hardisson, Theoretical diamagnetic susceptibilities for the Be isoelectronic sequence 1 (1967) 353
Hall, G.G., A variation principle for discontinuous wavefunctions 1 (1967) 495
Hall, G.G. and C.E. Solomon, Orbital equations for the transcorrelated wavefunction 4 (1969) 352
Halonen, V., see Inkinen 9 (1971) 639
Halpern, A.M., The vapor state emission from a saturated amine 6 (1970) 296
Halstead, C.J., and D.R. Jenkins, Catalysis of recombination reactions in flames by nitric oxide 2 (1968) 281
Hameka, H.F., see Gruninger 1 (1967) 14
Hameka, H.F., On the use of Green functions in atomic and molecular calculations V. The modified Green functions of the atoms 2 (1968) 96
Hameka, H.F., see O'Sullivan 4 (1969) 123
Hameka, H.F., see O'Sullivan 5 (1970) 576
Hameka, H.F., On the theory of linear electro-optical rotation I. The two-photon effect 7 (1970) 157
Hamilton, T.D.S. and K. Razi Naqvi, Isosbestic points in emission spectra 2 (1968) 374
Hammer, A., M. Schwoerer and H. Sixl, Zeeman effect in phosphorescent molecules 5 (1970) 434
Hamnett, A., see Cox 7 (1970) 414
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Hamrin, K., G. Johansson, U. Gelius, A. Fahlman, C. Nordling and K. Siegbahn, Ionization energies in methane and ethane measured by means of ESCA 1 (1968) 613
Hancock, G. and I.W.M. Smith, Infrared chemiluminescence from the reaction O + CS → CO + S 3 (1969) 573
Hancock, G. and I.W.M. Smith, Vibrational relaxation rates for CO ($v \leqslant 13$) with CO(v=0), OCS, O_2 and He 8 (1971) 41
Handel, D. and M.E. Michel-Beyerle, Sensitized injection of defect electronics into dibenz (a, h) anthracene through a charge transfer process 5 (1970) 377
Hankiewicz, E., see Kroh 1 (1968) 542
Hankins, D., J.W. Moskowitz and F.H. Stillinger, Hydrogen-bond energy nonadditivity in water 4 (1970) 527
Hansen, A.E. and E. Nørby Svendsen, Delta-function contributions in the calculation of oscillator strengths for an electron in a Coulomb potential 5 (1970) 483
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Harada, Y., J.N. Murrell and H.H. Sheena, The far ultraviolet spectra of methyl-silanes 1 (1968) 595
Haran, E.N., see Halevi 1 (1967) 475
Harding, M.J., S.F. Mason, D.J. Robbins and A.J. Thomson, Vibronic and spin-orbit coupling effects in the magnetic circular dichroism of nickel (II) bromate hexahydrate 7 (1970) 70
Hardisson, A., see Hall 1 (1967) 353
Haridasan, T.M. and J. Govindarajan, Lattice dynamics of hexagonal ice 4 (1969) 11
Harmon, J.F., Low frequency spin lattice relaxation in glycerol 7 (1970) 207
Harmony, M.D., Tunnelling in double-minimum potentials 10 (1971) 337
Harpold, M., see Nath 2 (1968) 471
Harrigan, E.T. and N. Hirota, Direct observation of triplet stete energy transfer from guest to host in mixed organic crystals 1 (1967) 281

Harrigan, R.W., see Watts 8 (1971) 49
Harris, C.B., see Tinti 3 (1969) 343
Harris, C.B., D.S. Tinti, M.A. El-Sayed and A.H. Maki, Optical detection of phosphorescent triplet state ENDOR in zero field 4 (1969) 409
Harris, C.B., see Buckley 4 (1970) 592
Harris, C.B., see Buckley 5 (1970) 205
Harris, C.B., see Francis 9 (1971) 181, 188
Harris, F.E., see Schaefer III 1 (1967) 407
Harris, F.E., see Michels 3 (1969) 441
Harris, F.E., see Monkhorst 3 (1969) 537
Harris, F.E. and H.J. Monkhorst, Lattice sums and Madelung constants 4 (1969) 181
Harrison, H.R. and B.E. Springett, Electron mobility variation in dense hydrogen gas 10 (1971) 418
Hartshorn, L.G., see Biedenkapp 5 (1970) 379
Harvey, J.S.M., Debye temperatures from ESR 10 (1971) 62
Haselbach, E., Jahn–Teller distortions in the radical cations of cyclopropane and allene 7 (1970) 428
Hasted, J.B., see Böhme 1 (1967) 259
Hasted, J.B., see Boness 1 (1967) 292
Hasted, J.B., see Larkin 5 (1970) 325
Hatano, H., see Kominami 9 (1971) 510
Hatch, G.F. and R. Kreilick, ^{13}C NMR spectra of nitroxide radicals 10 (1971) 490
Hatfield, E.E., see Villa 9 (1971) 568
Hatfield, W.E., see Warren 7 (1970) 371
Hatfield, W.E., see Barnes 7 (1970) 374
Hathorn, F.G.M., see Basco 8 (1971) 291
Haugsjaa, P.O., see Heller 10 (1971) 127
Haugsjaa, P.O., A. Heller and K.W. French, Mechanism of the cathode electroluminescence in inorganic ionic solutions: injection of electrons from the cathode into the electrical double layer 10 (1971) 130
Hauser, C. and P. Cornaz, Evidence by EPR of a complex $(TiO)^{3+}$ in the crystal of TiO_2 anatase 5 (1970) 226
Hausser, K.H., see Fischer 1 (1968) 665
Hauswirth, W. and M. Daniels, Radiationless transition rates of thymine and uracil in neutral aqueous solution at 300°K 10 (1971) 140
Hay, P.J. and W.A. Goddard III, The effect of symmetry restrictions upon the hyperfine properties 9 (1971) 356
Hayashi, H., K. Morigaki and S. Nagakura, Optical detection ESR for the n–π^* triplet state of benzil 9 (1971) 119
Hayes, R.G., see Zeller 10 (1971) 610
Hazi, A.U. and M.F. Fels, Computation of resonance parameters for elastic scattering 8 (1971) 582
Hazony, Y., R.C. Axtmann and J.W. Hurley Jr.,Covalency effects from Mössbauer experiments on the hydrates of $FeCl_2$ 2 (1968) 440
Hazony, Y., see Axtmann 2 (1968) 673
Hazony, Y. and R.C. Axtmann, On QS-IS correlations in iron compounds 8 (1971) 571
Heastie, R., see Arnold 1 (1967) 51
Hedges, R.M., see Hofer 6 (1970) 67
Hehre, W.J. and J.A. Pople, Atomic electron populations for some simple molecules 2 (1968) 379
Hehre, W.J., see Lathan 3 (1969) 579
Hehre, W.J., see Ditchfield 5 (1970) 13

Heil, T.G., S.V. O'Neil and H.F. Schaeffer III, High precision valence bond potential curve for the Cl_2 molecule 5 (1970) 253
Heilbronner, E., see Binsch 1 (1967) 135
Heimbach, P., see Traunmüller 3 (1969) 300
Heinrichs, J., Influence of molecular interactions of the Clausius–Mossotti function for nonpolar gases 1 (1967) 467
Erratum 1 (1968) 560
Heinrichs, J., New derivation of time-dependent Hartree–Fock theory 2 (1968) 315
Heinrichs, J., Effect of molecular interactions on the dielectric constant for multi-level systems 4 (1969) 151
Heinrichs, J., see Schmit 7 (1970) 593
Heinzelmann, W. and H. Labhart, Triplet–triplet spectra and triplet quantum yields of some aromatic hydrocarbons in liquid solution 4 (1969) 20
Held, W.-D., J. Schöttler and J.P. Toennies, Experimental cross sections for individual vibrational quantum transitions in low energy central collisions of Li^+ with H_2 6 (1970) 304
Hélène, C. and Th. Montenay-Garestier, Excitation energy transfer in molecular aggregates of nucleic acid derivatives in frozen aqueous solutions 2 (1968) 25
Hélène, G., see Lancelot 9 (1971) 327
Heller, A., K.W. French and P.O. Haugsjaa, Cathodic electroluminescence in inorganic liquids: formation of excited cations in electrode processes 10 (1971) 127
Heller, A., see Haugsjaa 10 (1971) 130
Heller, H.C., see Rimai 10 (1971) 207
Hellner, L., see Sieck 10 (1971) 502
Hemsworth, R.S., R.C. Bolden, M.J. Shaw and N.D. Twiddy, Measurements of thermal energy neon ion-neutral reaction rate coefficients 5 (1970) 237
Hemsworth, R.S., see Shaw 8 (1971) 148
Henderson, D., see Kim 2 (1968) 619
Henderson, D., see Kim 3 (1969) 728
Henderson, D., see Oden 8 (1971) 85
Hendrickson, D.N., see Sohn 6 (1970) 499
Hendriks, B.M.P., see Canters 1 (1968) 627
Henneker, W.H. and P.E. Cade, Electron distributions of diatomic molecules in momentum space 2 (1968) 575
Henning, J.C.M., Semi-empirical calculation of ^{14}N hyperfine coupling factors in heterocyclic anions 1 (1968) 678
Henrichs, J.M., see Zijlstra 7 (1970) 553
Henry, B.R. and W. Siebrand, Spin–orbit coupling in aromatic hydrocarbons. The radiative triplet lifetime of naphthalene 3 (1969) 90
Erratum 3 (1969) 728
Henry, B.R. and W. Siebrand, Calculation of the isotope effect on the triplet lifetime of partially deuterated naphthalenes 3 (1969) 327
Henry, B.R. and W. Siebrand, Theory of electron spin alignment through non-radiative processes in naphthalene and anthracene 7 (1970) 533
Herino, R., see Briere 9 (1971) 285
Herman, Z., see Čermák 2 (1968) 359
Herndon, W.C., Unparametrized localized orbital calculations for saturated hydrocarbons 10 (1971) 460
Herre, W., see Briegleb 3 (1969) 146
Herre, W., see Briegleb 4 (1969) 53

Herre, W. and P. Weis, Polarization of the triplet–singlet $n\pi^*$ - luminescence of *p*-benzoquinone and *p*-toluquinone 7 (1970) 276
Herring, F.G., see Branton 3 (1969) 581
Herring, F.G., see Frost 4 (1970) 533
Herring, F.G., see Frost 5 (1970) 291
Herring, F.G., see Eachus 5 (1970) 405
Herring, F.G., see Cornford 10 (1971) 345
Herring, F.G., see Frost 10 (1971) 347
Herrmann, E.C., The virial theorem in the Born–Oppenheimer approximation for in-homogeneous potentials 1 (1967) 253
Herschbach, D.R., see Anderson 4 (1969) 5
Herschbach, D.R., see Kempter 6 (1970) 97
Herschbach, D.R., see Lacmann 6 (1970) 106
Herzenberg, A., see Abram 3 (1969) 187
Hess, S. and F.R. McCourt, Kinetic theory of electron spin relaxation in the gas phase 5 (1970) 53
Hesselmann, I.A.M., see Schmidt 1 (1967) 434
Heyde, M.E., see Rimai 10 (1971) 207
Heydtmann, H., Calculated unimolecular rate constants for the decomposition of tertiary chloride 1 (1967) 105, 246
Heyns, A.M., see Schutte 1 (1967) 487
Heyns, A.M., see Schutte 1 (1968) 511, 515
Hibma, T., see Vegter 3 (1969) 427
Hilbers, C.W. and C. MacLean, Electric field effects in NMR 2 (1968) 445
Hilbers, C.W. and C. MacLean, Electric field induced dipolar couplings in the proton NMR spectra of nitrobenzene and 2,4-dimethylnitrobenzene 7 (1970) 587
Hill, N.E., Optical absorption and dielectric loss due to resonance in liquids 2 (1968) 5
Hillier, I.H. and V.R. Saunders, Ab initio calculations of d orbital participation in some sulphur compounds 4 (1969) 163
Hillier, I.H. and V.R. Saunders, Ab initio calculations of the ground and excited states of H_2S 5 (1970) 384
Hillier, I.H., see Bassett 6 (1970) 253
Hillier, I.H., V.R. Saunders and M.H. Wood, On the contribution of orbital relaxation to ESCA chemical shifts 7 (1970) 323
Hillier, I.H. and V.R. Saunders, Ab initio calculations of the excited states of the permanganate and chromate ions 9 (1971) 219
Hillier, I.H., see Barber 9 (1971) 570
Hillis, J.E. and M.K. DeArmond, Metal localized luminescence in rhodium(III) and iridium(III) sulphur chelates 10 (1971) 325
Hilpern, J.W., see Godfrey 1 (1967) 490
Hinchliffe, A. and D.B. Cook, An ab initio calculation of hyperfine coupling constants in HCO radical 1 (1967) 217
Hinchliffe, A., see Cook 3 (1969) 223
Hinkelmann, H., see Bingel 1 (1967) 251
Hirao, K., see Nakatsuji 6 (1970) 541
Hirayama, F., W. Rothman and S. Lipsky, Fluorescence of saturated hydrocarbons. II. The effect of alkyl substituents 5 (1970) 296
Erratum 6 (1970) 124
Hirota, N., see Harrigan 1 (1967) 281
Hirota, N., see Nakamura 3 (1969) 134, 137

Hirota, N., EPR studies of n-π^* triplet states and the comparison of the n-π^* and π-π^* triplet states of aromatic carbonyl compounds 4 (1969) 305
Hirota, N., see Takeshita 4 (1969) 369
Hirschfelder, J.O., Perturbation theory for exchange forces, I 1 (1967) 325
Hirschfelder, J.O., Perturbation theory for exchange forces, II 1 (1967) 363
Hirschfelder, J.O., see Certain 2 (1968) 274
Hirschfelder, J.O. and P.R. Certain, On the modification of exchange perturbation theories 2 (1968) 539
Hirschfelder, J.O., see Certain 4 (1969) 401
Hirst, D.M. and P.H. Mackey, Non-paired spatial orbitals wavefunctions for naphthalene 3 (1969) 255
Ho, W., see Birnbaum 5 (1970) 334
Hochstrasser, R.M. and A.P. Marchetti, The polarization of the allowed triplet–triplet absorption in anthracene 1 (1968) 597
Hochstrasser, R.M. and L.J. Noe, Excited state dipole moments of phenanthrene: electric field modulation of the luminescence 5 (1970) 489
Hochstrasser, R.M., see Castro 6 (1970) 180
Hochstrasser, R.M. and P.N. Prasad, Different spectra for different sites in mixed crystals 8 (1971) 315
Hochstrasser, R.M. and P.N. Prasad, Some aspects of spin–lattice relaxation amongst triplet states of molecules and molecular excitons 9 (1971) 113
Hochstrasser, R.M., J.E. Wessel, J.D. Whiteman and A.H. Zewail, Characterization of triplet states of axially symmetric benzenes using the Zeeman effect 10(1971) 452
Hodgson, D.J., see Barnes 7 (1970) 374
Hofacker, G.L. and R.D. Levine, A non-adiabatic model for population inversion in molecular collisions 9 (1971) 617
Hofer, O.C. and R.M. Hedges, Electronic states of azulene and naphthalene calculated by CNDO/2 CI 6 (1970) 67
Hoff, J., see Azima 7 (1970) 565
Hoffmann, R., see Jordan 10 (1971) 572
Hohlneicher, G., see Distler 7 (1970) 345
Holdren Jr., G.R., see Ferrell 9 (1971) 343
Holleman, G.W., see Yardley 10 (1971) 266
Hollister, C., J.W. Moskowitz and H. Basch, An SCF MO calculation on nickel hexafluoride in a gaussian basis 3 (1969) 185, 728
Hollister, C., see Bach 4 (1969) 79
Holt, C.W. and M.C.L. Gerry, The microwave spectrum, structure and nuclear quadrupole coupling constants of sulphuryl chloride fluoride SO_2ClF 9 (1971) 621
Holzer, W., W.F. Murphy and H.J. Bernstein, Resonance Raman effect of S_3^- doped in a NaCl single crystal 4 (1970) 641
Honeybourne, C.L. and G.A. Webb, Electron delocalisation, spin density distribution and anomalous relaxation from isotropic proton magnetic resonance shifts 2 (1968) 426
Honeybourne, C.L., Electron spin density distribution in the mobile phenyl rings of malondianils 8 (1971) 493
Honig, B., see Sharf 7 (1970) 132
Hooymayers, H.P. and C.Th.J. Alkemade, Relationship between cross section for doublet mixing and Massey parameter for alkali–noble gas atom collisions 4 (1969) 277
Horák, Z.J. and J. Šišková, Continuum contribution to second order long range forces 6 (1970) 375
Hornback, C.J., see Schulman 8 (1971) 361
Horrocks, D.L. and W.G. Brown, Solution fluorescence spectrum of highly purified fluorene 5 (1970) 117
Horsley, J., see Cornille 6 (1970) 373
Horsley, J.A. and F. Flouquet, The dissociation of NH_3 and H_2O in excited states 5 (1970) 165
Hoshen, J. and J. Jortner, Substitutional disorder in mixed molecular crystals 5 (1970) 351

Hosteny, R.P., R.R. Gilman, T.H. Dunning Jr., A Pipano and I. Shavitt, Comparison of Slater and contracted gaussian basis sets in SCF and CI calculations on H_2O 7 (1970) 325
Hotop, H. and A. Niehaus, Vibrational excitation of H_2^+ ($X^2\Sigma_g^+$)-ions formed in collisions with He(2^3S)-metastables 3 (1969) 687
Hotop, H., see Fuchs 4 (1969) 71
Hotop, H. and A. Niehaus, Angular distributions of Penning electrons 8 (1971) 497
Hotop, H., E. Illenberger, H. Morgner and A. Niehaus, Penning electron spectra from ionization of hydrogen atoms by He(2^1S) and He(2^3S)-metastables 10 (1971) 493
Howard, C.J., see Allen 6 (1970) 169
Howard, J.A., see Bennett 9 (1971) 460
Howard, R.S. and C.H. Dugan, Pressure broadening of OI λ 5577 by argon 8 (1971) 433
Hoyer, E., see Kirmse 4 (1970) 565
Hoyland, J.R., Barriers to internal rotation in propane 1 (1967) 247
Hoytink, G.J., see Jesse 1 (1967) 109
Hoytink, G.J., see Rettschnick 1 (1967) 145
Hoytink, G.J., see Langelaar 1 (1968) 609
Hoytink, G.J., see Glasbeek 2 (1968) 312
Hoytink, G.J., see Geldof 4 (1969) 59
Hoytink, G.J., see Brugman 8 (1971) 263, 574
Hoytink, G.J., see Geldof 10 (1971) 549
Hsieh, J.C., U. Laor and P.K. Ludwig, Consideration of the absorption characteristics of organic vapors in interpretation of the decay properties of excited vibronic states: naphthalene 10 (1971) 412
Hsieh, Y.-N., see Koo 9 (1971) 238
Hsu, F.H., see Hadley Jr. 7 (1970) 465
Hsu, H., see Peyerimhoff 8 (1971) 129
Hsu, S.L., W.H. Flygare, Microwave spectrum and the barrier to internal rotation of the methyl group in *trans*-croton-aldehyde 4 (1969) 317
Hudson, A., Asymmetric line widths and the sign of the isotropic chlorine hyperfine interactions in chloroalkyl radicals 4 (1969) 295
Hudson, A., see Bowles 5 (1970) 552
Huebner, R.H., R.N. Compton and H.C. Schweinler, Temporary negative ion resonance of pyridine 2 (1968) 407
Hughes, B.M., see Lifshitz 7 (1970) 469
Hughes, R.C., Geminate recombination of X-ray excited carriers in organic solids: poly-N-vinylcarbazole 8 (1971) 403
Hull, S.E., see Dixon 3 (1969) 367
Hultgren, G.O. and C.W. Kern, Comments on configuration interaction combined with a correlation factor for two-electron atoms 10 (1971) 233
Hunding, A., see Nyeland 5 (1970) 143
Hunding, A., Exact quantum-mechanical calculation of inelastic transition probabilities of a collinear collision of a particle with a Morse oscillator 6 (1970) 444
Hunt, W.J. and W.A. Goddard III, Excited states of H_2O using improved virtual orbitals 3 (1969) 414
Hunt, W.J., T.H. Dunning Jr. and W.A. Goddard III, The orthogonality constrained basis set expansion method for treating off-diagonal Lagrange multipliers in calculations of electronic wavefunctions 3 (1969) 606
Hunt, W.J., see Dunning Jr. 4 (1969) 147
Hunt, W.J., see Goddard III 4 (1969) 231

Hunt, W.J., W.A. Goddard III and T.H. Dunning Jr., The incorporation of quadratic convergence into open-shell self-consistent field equations 6 (1970) 147
Hunter, T.F. and R.F. Wyatt, Intersystem crossing in anthracene 6 (1970) 221
Hunziker, H.E., Formation of triplet naphthalene by energy transfer from $Hg(6^3P_0)$ atoms, observed by a modulation technique 3 (1969) 504
Hunziker, H.E., see Burton 6 (1970) 352
Huong, P.V., M. Couzi and M. Perrot, Molecular motions of hydrogen halides and deuterium halides in liquid sulphur hexafluoride 7 (1970) 189
Hurley Jr., J.W., see Hazony 2 (1968) 440
Hurley Jr., J.W., see Axtmann 2 (1968) 673
Huron, M.-J. and P. Claverie, Practical improvements for the calculation of intermolecular energies 4 (1969) 429
Huron, M.-J. and P. Claverie, Study of solute-solvent interactions 9 (1971) 194
Hurst, H.J., R.J.C. Brown and R.N. Whittem, NMR study of ionic motion in $NaBF_4$ 1 (1968) 647
Hurst, H.J., Calculated second moments for fluoborate salts including evidence for jump reorientation 4 (1970) 531
Husain, D., see Donovan 6 (1970) 488
Husain, D., see Donovan 7 (1970) 453
Husain, D. and L.J. Kirsch, Kinetic investigation of $C(2^3P_J)$ by photoelectric measurement of the attenuation of atomic emission in the vacuum ultraviolet 8 (1971) 543
Husain, D. and L.J. Kirsch, The study of electronically excited carbon atoms, $C(2^1D_2)$, by photoelectric measurement of time-resolved atomic absorption 9 (1971) 412
Husain, D., see Deakin 10 (1971) 146
Hush, N.S., see Clack 1 (1967) 157
Hush, N.S. and J.R. Yandle, Calculation of dipole moments of some heterocyclic molecules by the CNDO molecular orbital method 1 (1967) 493
Hush, N.S. and M.L. Williams, Finite-perturbation SCF valence-shell calculations of molecular polarizability and hyperpolarizability components 5 (1970) 507
Hush, N.S. and M.L. Williams, Finite electric field SCF calculations of molecular polarizabilities: absolute polarizabilities 6 (1970) 163
Hush, N.S. and M.L. Williams, Oscillator strengths in porphyrins 8 (1971) 179
Huss, E.B., see Gregg 8 (1971) 609
Hutley, M.C. and D.J. Jacobs, The resonance Raman effect in *p*-nitroaniline 3 (1969) 711
Hutley, M.C. and D.J. Jacobs, Some measurements of the resonance Raman effect in β-carotene 6 (1970) 269
Hutson, V.C.L., see Burley 9 (1971) 109
Huy, L.-K., W. Forst and Z. Prášil, Anharmonic correction factor for vibrational sum of states 9 (1971) 476
Huybrechts, G., see Le-Khac Huy 3 (1969) 307
Huybrechts, G., see Bertrand 5 (1970) 183
Huybrechts, G.H., see de Maré 1 (1967) 64
Huzinaga, S., Analytic SCF wavefunctions for transition-metal atoms 6 (1970) 393
Hwa-Sheng Cheng, see Ruby 2 (1968) 39
Hyatt, D. and L. Stanton, Influence of rotational energy on ion–molecule cross sections: ortho and para hydrogen and deuterium 10 (1971) 10
Hyde, J.S., see Leniart 6 (1970) 637
Hyman, H.A., Electron correlation resulting in strong ion laser lines 10 (1971) 24
Hynne, F., see Bullough 2 (1968) 293, 307

Iannarella, L., see Gomes 3 (1969) 167

Illenberger, E., see Hotop 10 (1971) 493
Imhof, R.E. and F.H. Read, An electron–photon coincidence method for measuring atomic and molecular lifetimes 3 (1969) 652
Imoto, S., see Miyake 4 (1969) 275
Inacker, O., H. Kuhn, H. Bücher, H. Meyer and K.H. Tews, Monolayer assembling technique used to determine the multipole nature of the phosphorescence of a dye molecule 7 (1970) 213
Erratum 7 (1970) 639
Inghram, M., see Villarejo 2 (1968) 11
Inkinen, O., V. Halonen and S. Manninen, Compton profiles of hexane and decane 9 (1971) 639
Inokuchi, H., see Kawamura 5 (1970) 80
Inokuti, M., see de Heer 1 (1967) 484
Inoue, A., see Yoshihara 9 (1971) 469
Ishida, H. and H. Tsubomura, Absorption spectra arising from the interaction between aromatic hydrocarbons and aliphatic amines 9 (1971) 296
Israeli, M., see Chen 7 (1970) 171
Ito, M., Raman spectrum and molecular motions of hydrogen bromide crystal 7 (1970) 439
Itoh, K., Electron spin resonance of an aromatic hydrocarbon in its quintet ground state 1 (1967) 235
Itoh, M., Exciton splitting of absorption spectra in radical dimers 2 (1968) 371
Iverson, A. and B.R. Russell, The vacuum ultraviolet spectra of three transition metal hexacarbonyls 6 (1970) 307
Iwasaki, M. and B. Eda, Electron spin resonance of γ-ray produced ion radical pairs in a single crystal of maleic anhydride 8 (1968) 210
Izod, T.P.J. and R.P. Wayne, Energy transfer from $O(^1D)$ to O_2 4 (1969) 208

Jackson, J.L. and R.E. Wyatt, Fast determination of resonance states in atomic collisions 4 (1970) 643
Jackson, M., R.P. McEachran and M. Cohen, The James wavefunction for the ground state of H_2^+ 10 (1971) 143
Jackson, R.A., see Bowles 5 (1970) 552
Jacobs, D.J., see Hutley 3 (1969) 711
Jacobs, D.J., see Finnigan 6 (1970) 141
Jacobs, D.J., see Hutley 6 (1970) 269
Jacobson, T.V. and G.H. Kimbell, Transversely pulse-initiated chemical lasers: preliminary performance of the HF system 8 (1971) 309
Jain, D.V.S. and K.K. Tewari, Hydrodynamic properties of short chain *n*-alkanes 10 (1971) 487
Jain, S.C. and R.C. Bhandari, Bulk viscosity of liquid D_2O 2 (1968) 33
Jakab, L. and M. Randić, A Laplace transform wavefunction for the hydrogen molecule ion ground state 6 (1970) 569
James, B.H., see Brown 1 (1967) 459
James, D.G.L., see Basco 8 (1971) 265
James, D.W., see Devlin 7 (1970) 237
James, F.C., see Basco 8 (1971) 265
Janakiraman, R. and G.C. Upreti, Electron paramagnetc resonance of Mn^{2+} in ferrous ammonium sulphate hexahydrate 4 (1970) 550
Jancsó, G., G. Németh and B. Gellai, Application of the minimax approximation to the evaluation of the specific heat of crystals 7 (1970) 314
Jankow, R., see Binsch 1 (1967) 135
Jano, I. and Y. Mori, The mechanism of the formation of fulvene from the gas phase-irradiated benzene 2 (1968) 185

Jano, I., On the photoisomerization of the alkylderivatives of benzene 2 (1968) 205
Jano, I., Theoretical considerations of the photodissociation of the azocompounds 2 (1968) 643
Jansen, F.H., see Passchier 7 (1970) 521
Jansen, H.B. and P. Ros, Non-empirical molecular orbital calculations on the protonation of carbon monoxide 3 (1969) 140
Jansen, L. and E. Lombardi, Three-body exchange forces in rare-gas crystals 1 (1967) 33
Jansen, L. and E. Lombardi, Exchange interactions between atoms or molecules in different perturbation formalisms. Application to three-atom exchange forces 1 (1967) 417
Jansson, K., R. Scullman and B. Yttermo, The spectrum of IrC in the region 4800–5300 Å 4 (1969) 188
Japar, S.M., M. Pomerantz and E.W. Abrahamson, Common intermediates in the transfer of triplet excitation energy and molecular exchange reactions 2 (1968) 137
Jellinek, F., see Vriezen 1 (1967) 284
Jenkins, D.R., see Halstead 2 (1968) 281
Jenkins, D.R., see Bulewicz 9 (1971) 467
Jenkins, H.D.B., Truncation of Bertaut Madelung Series for lattices involving extended charge distributions 9 (1971) 473
Jenkins, H.D.B., see Dixon 10 (1971) 600
Jensen, R.J. and W.W. Rice, Electric discharge initiated SF_6–H_2 and SF_6–HBr chemical lasers 7 (1970) 627
Jensen, R.J. and W.W. Rice, Thermally initiated HF chemical laser 8 (1971) 214
Jesse, G.W., see Böhme 3 (1969) 329
Jesse, R.E. and G.J. Hoytink, The ground state of the coronene dinegative ion 1 (1967) 109
Jeziorski, B. and W. Kołos, On the ionization potential of H_2 3 (1969) 677
Jha, B.L. and D. Ramachandra Rao, Emission spectrum of Te_2 3 (1969) 175
Jhon, M.S., see Kihara 7 (1970) 559
Jhon, M.S., see Kihara 9 (1971) 62
Johansen, H., see Dahl 6 (1970) 64
Johansson, G., see Hamrin 1 (1968) 557, 613
Johnson, B.R., D. Secrest, W.A. Lester Jr. and R.B. Bernstein, A validation of the method of amplitude density functions in computing the *S*-matrix for a scattering problem 1 (1967) 396
Johnson, B.R., see Levine 1 (1968) 517
Johnson, B.R., see Levine 2 (1968) 545
Johnson, B.R., M. Shapiro and R.D. Levine, Rotational excitation in molecular collisions: the role of closed channels and resonances 3 (1969) 131
Johnson, B.R., see Levine 4 (1969) 365
Johnson, B.R., G.G. Balint-Kurti and R.D. Levine, The determination of bound and quasi-bound (resonance) state energies for molecular interactions 7 (1970) 268
Johnson, B.R., see Levine 7 (1970) 404
Johnson, B.R., see Levine 8 (1971) 501
Johnson, C.E., see Parish 6 (1970) 239
Johnson, C.E., see Fitzsimmons 6 (1970) 267
Johnson, C.S., see McIntyre 4 (1970) 585
Johnson, D.L., see Doane 6 (1970) 291
Johnson, K.H. and F.C. Smith Jr., SCF calculations of the electronic structures of the sulfate and perchlorate ions by the scattered-wave model 7 (1970) 541
Johnson, K.H. and F.C. Smith Jr., Scattered-wave model for the electronic structure and optical properties of the permanganate ion 10 (1971) 219

Johnson, K.H., see Connolly 10 (1971) 616
Johnson, L.L. and R.E. Roberts, A semi-classical treatment of collision induced dissociation 7 (1970) 480
Johnson, L.W. and S.P. McGlynn, The electronic absorption spectrum of chromate ion 7 (1970) 618
Johnson, L.W. and S.P. McGlynn, Electronic absorption spectrum of $Ba(MnO_4)_2 . 3H_2O/Ba(ClO_4)_2 . 3H_2O$ 10 (1971) 595
Johnson, O., see Fajans 9 (1971) 95
Johnson, P.C. and H.W. Offen, Pressure dependence of intersystem crossing in anthracene and two derivatives at 77°K 6 (1970) 505
Johnson, P.M. and S.A. Rice, Intramolecular formation of *p*-methylbenzyl radical from *p*-xylene 1 (1968) 709
Johnson, R.E. and P.R. Certain, Comment on van der Avoird's wave operator formalism 1 (1967) 413
Johnson, R.E. and S.T. Epstein, Connections between several perturbation theories of intermolecular forces 1 (1968) 599
Johnson, R.E., see Epstein 1 (1968) 602
Johnson, R.L. and D.W. Setser, Infrared chemiluminescence from hydrogen atom reactions with the sulphur–chlorine bond 3 (1969) 207
Johnson, R.L., see Chang 9 (1971) 587
Johnston, G.R. and L.E. Lyons, The effect of surface purity on the photo-generation of charge carriers in anthracene single crystals 2 (1968) 489
Johnston, G.R., Current-voltage responses for dark conduction through anthracene crystals 3 (1969) 699
Jonah, C.D. and R.N. Zare, Formation of group IIA dihalides by two-body radiative association 9 (1971) 65
Jonassen, H.B., see Fogleman 3 (1969) 52
Jonathan, N., C.M. Melliar-Smith and D.H. Slater, Infrared emission from the reaction of atomic fluorine with hydrogen chloride – a possible new chemical laser system 7 (1970) 257
Jonathan, N., A. Morris, D.J. Smith and K.J. Ross, Photoelectron spectra of ground state atomic hydrogen, nitrogen and oxygen 7 (1970) 497
Jonathan, N., D.J. Smith and K.J. Ross, The high resolution photoelectron spectra of transient species: sulphur monoxide 9 (1971) 217
Jones, D.S., see Halgren 8 (1971) 547
Jones, M.T., M.D. Rataiczak and I.M. Brown, Benzene anion radical: removal of the orbital degeneracy at 4.2°K 2 (1968) 493
Jones, M.T., On hyperfine modulation models for spin–lattice relaxation in the benzene anion radical 4 (1969) 413
Jones, P.F. and S. Siegel, Intersystem crossing in pyrene-h_{10} and pyrene-d_{10} 2 (1968) 486
Jones, P.F. and A.R. Calloway, Temperature effects on the intramolecular decay of the lowest triplet state of benzophenone 10 (1971) 438
Jones, R.G., see Duxbury 8 (1971) 439
Jones, R.P., see Rentzepis 4 (1970) 599
Jones, R.P., see Topp 9 (1971) 1
Jonkman, L. and J. Kommandeur, Solvent induced conformational kinetics (SICK) 5 (1970) 579
Jonsson, B.-Ö., see Lindholm 1 (1967) 501
Jordan, A.D., I.G. Ross. R. Hoffmann, J.R. Swenson and R. Gleiter,through bond interactions of non-bonding orbitals: the n, π^* states of azanaphthalenes 10 (1971) 572
Jordan, F., see Diner 2 (1968) 319
Jørgensen, C.K., Kinetic energy as an essential constituent of non-diagonal elements and spectrochemical parameters 1 (1967) 11
Jørgensen, C.K., see Kuse 1 (1967) 314
Jørgensen, C.K., see Day 1 (1968) 507

Jørgensen, C.K., Neptunium (VII), nobelium (II), 126 (IV) and other unexpected oxidation states of trans-uranium elements 2 (1968) 549
Jørgensen, C.K., see Mullen 3 (1969) 49
Jørgensen, C.K., Stereochemistry and the choice between alternative descriptions of oxidation states 3 (1969) 380
Jørgensen, C.K., see Meriaudeau 5 (1970) 131
Jørgensen, C.K., see Schmidtke 5 (1970) 202
Jørgensen, C.K., see Emschwiller 5 (1970) 561
Jørgensen, C.K., see Penneman 8 (1971) 321
Jørgensen, C.K., see Geier 9 (1971) 263
Jørgensen, W.L. and L.C. Allen, Charge distribution characteristics of attractive dominant barriers 7 (1970) 483
Jortner, J., see Sharf 2 (1968) 68
Jortner, J., see Katz 2 (1968) 189, 437
Jortner, J., see Raz 4 (1969) 155
Jortner, J., see Raz 4 (1970) 511
Jortner, J., see Rentzepis 4 (1970) 599
Jortner, J., see Hoshen 5 (1970) 351
Jortner, J., see Gelbart 6 (1970) 345
Jortner, J., see Miron 6 (1970) 563
Jortner, J., see Nitzan 8 (1971) 445
Jortner, J., see Raz 9 (1971) 222
Jortner, J., see Nitzan 9 (1971) 273
Jortner, J., see Wannier 10 (1971) 102, 193
Joshi, R.K., The rigid sphere perturbation procedure for theoretical evaluation of the transport coefficients of pure gases 1 (1968) 575
Joussot-Dubien, J., see Bonneau 2 (1968) 65
Joussot-Dubien, J., see Bonneau 3 (1969) 353
Julienne, P.S., Predissociation of the $H_2D^1\Pi_u$ state 8 (1971) 27
Jung, C.K., A.M. Ronn and J.T. Latourrette, Passive Q-switching of a CO_2-N_2-He laser with CH_3Br gas 5 (1970) 67
Jungen, M., Ab-initio calculations of small hydrides including electron correlation. Calculation of some points of the potential surface of BH_2^+ 5 (1970) 241

Kacsóh, L., see Cameron 8 (1971) 628
Kahn, L.R. and W.A. Goddard III, A direct test of the validity of the use of pseudopotentials in molecules 2 (1968) 667
Kalantar, A.H., see Martin 1 (1968) 623
Kalantar, A.H., see Martin 4 (1969) 235
Kalinowski, M.K., Ion-pair effects in electrochemistry of aromatic compounds. Influence of supporting electrolyte cations on half-wave potentials of the ketone-ketyl radical anion systems 7 (1970) 55
Kalinowski, M.K., Ion-pair effects in electrochemistry of aromatic compounds. The influence of supporting electrolyte cations on the ρ_π constant of Hammett's equation 8 (1971) 378
Kalos, F. and A.E. Grosser, Crossed molecular beam measurement of the N_2 + Ar differential elastic cross section: energy dependence of the rainbow scattering 6 (1970) 537
Kamal Kumar, The low-temperature infrared spectrum of polycrystalline trimethyl acetonitrile 9 (1971) 71

Kamal Kumar, Rotational isomerism in triethylamine 9 (1971) 504
Kameswara Rao, K. and C.R.K. Murty, Temperature variation and Zeeman effect investigation of NQR of ^{79}Br in *p*-bromoacetanilide 1 (1967) 323
Kammer, W.E., Ab initio SCF and CI calculations of linear and bent acetylene 6 (1970) 529
Kammer, W.E., see Peyerimhoff 8 (1971) 129
Kamyshov, N.V., see Leonas 8 (1971) 282
Kandel, L.D., see Ortega 3 (1969) 35
Kanekar, C.R., see Khetrapal 9 (1971) 437
Kanekar, C.R., see Dhingra 10 (1971) 86
Kanellakopulos, B., see von Ammon 2 (1968) 513
Kaplan, J.I. and M.L. Glasser, Nuclear self coupling via the hyperfine interaction in molecules 4 (1969) 103
Kaplan, J.I. and E. Drauglis, On the statistical theory of the nematic mesophase 9 (1971) 645
Kaplan, M., see Nozik 1 (1967) 391
Kaplan, M., see DiLorenzo 2 (1968) 509
Kaplan, M., see Ehrlich 3 (1969) 161
Kaplan, M., see DiLorenzo 3 (1969) 216
Kapoor, Q.S., see Nigam 4 (1969, 1970) 455, 639
Kapralova, G.A., E.E. Nikitin and A.M. Chaikin, Non-empirical calculations of the probabilities of vibrational transitions in hydrogen halide molecules 2 (1968) 581
Kapsomenos, G.S., see André 8 (1971) 195
Kaptein, R., Chemically induced dynamic nuclear polarization in five alkyl radicals 2 (1968) 261
Kaptein, R. and L.J. Oosterhoff, Chemically induced dynamic nuclear polarization II(Relation with anomalous ESR spectra) 4 (1969) 195
Kaptein, R. and L.J. Oosterhoff, Chemically induced dynamic nuclear polarization III (Anomalous multiplets of radical coupling and disproportionation products) 4 (1969) 214
Kaptein, R., see den Hollander 10 (1971) 430
Kapuy, E., Calculation of the π-electron correlation energy of butadiene using the extended separated pair theory 3 (1969) 43
Kari, R. and B.T. Sutcliffe, Direct minimisation of the energy functional in some open-shell LCAO calculations on atoms 7 (1970) 149
Karraker, D.G., see Siddall 3 (1969) 498
Kasha, M., see Marrs 6 (1970) 235
Kasuya, T., see Yoshihara 9 (1971) 469
Kasper, J.V.V., see Campbell 10 (1971) 436
Kato, H., see Yonezawa 2 (1968) 454
Kato, H., see Nakatsuji 4 (1970) 607
Kato, J., see Nakatsuji 6 (1970) 541
Katrib, A., see Frost 10 (1971) 347
Katriel, J., An expansion theorem for products of generalized Hermite–Gauss functions 3 (1969) 624
Katriel, J., Molecular integrals over gaussian functions 4 (1969) 397
Katriel, J. and G. Adam, A comparative study of ellipsoidal gaussians: H_2^+ 4 (1970) 596
Katriel, J. and G. Adam, Shape restricted wavefunctions: two center spherical limits for H_2^+ 6 (1970) 431
Katriel, J. and G. Adam, Exact analytic evaluation of the H_2^+ force constant 8 (1971) 191
Katriel, J. and G. Adam, Shape restricted wavefunctions: ellipsoidal limits for ground and excited σ_g states of H_2^+ 10 (1971) 533
Katz, B., M. Brith, A. Ron, B. Sharf and J. Jortner, An experimental study of the higher excited states of benzene in a rare gas matrix 2 (1968) 189
Katz, B. and J. Jortner, Observation of molecular Rydberg states in rare gas solids 2 (1968) 437

Katz, B. and A. Ron, Far infrared spectra of HCl and DCl in a nitrogen matrix 7 (1970) 357
Kaufman, F., see Keyser 2 (1968) 523
Kaufman, J.J., see Pipano 7 (1970) 99
Kawabe, M., K. Masuda and S. Namba, Saturation of the fluorescence of tetracene in anthracene crystals 8 (1971) 448
Kawamura, H., M. Tsuda and H. Inokuchi, Photoemission from hydrogen-chemisorbed benzonitrile– rubidium ion salt film 5 (1970) 80
Kawamura, T., see Yonezawa 2 (1968) 454
Kazan, J., see Brinen 5 (1970) 150
Kazzaz, A.A., see Birks 1 (1967) 307
Kchristenko, S.V., see Vetchinkin 1 (1967) 437
Kearns, D.R., see Batley 2 (1968) 423
Kearns, D.R., see Derwent 6 (1970) 115
Kebabcioglu, R. and A. Müller, SCCC MO calculations on the ions WX_4^{2-}, MoX_4^{2-} and VX_4^{3-} (X=O, S, Se) 8 (1971) 59
Keeton, M. and D.P. Santry, Ab initio calculations for the 3d-exponent of phosphorous and sulphur 7 (1970) 105
Keizer, J.E., On the necessity of using the master equation to describe the chemical reaction $X + A \rightleftharpoons B + X$ 10 (1971) 371
Keller, B. and F. Kneubühl, Group theory of molecular angular auto-correlation functions 9 (1971) 178
Keller, G.E. and F.E. Niles, Labile clustering and its effects 10 (1971) 526
Keller, R.A., Excited triplet–singlet intersystem crossing 3 (1969) 27
Kempter, V., W. Mecklenbrauck, M. Menzinger, G. Schuller, D.R. Herschbach and Ch. Schlier, Electronic excitation of K atoms in collisions with diatomic molecules: thresholds and energy dependence from 1–5 eV 6 (1970) 97
Kennedy, D.J., see Manson 7 (1970) 387
Kent, J.E., see Blackman 1 (1967) 379
Kent, J.E., M.F. O'Dwyer and R.J. Stephens, Phosphorescence lifetimes of substituted benzenes 10 (1971) 201
Kepford, C.R., see Ultee 3 (1969) 337
Kern, C.W., see Pritchard 5 (1970) 529
Kern, C.W., see Hultgren 10 (1971) 233
Kessenikh, A.V., S.V. Rykov and A.Z. Yankelevich, The chemical polarization of the proton spins in the ^{13}C containing molecules 9 (1971) 347
Kestner, N.R., An estimate of three electron correlation effects in the neon atom 3 (1969) 226
Kestner, N.R., see Riemenschneider 5 (1970) 381
Keszthelyi, L., see Cameron 4 (1969) 229
Keszthelyi, L., see Cameron 8 (1971) 628
Kevan, L., see Bales 3 (1969) 484
Kevan, L., see Fueki 4 (1969) 313
Kevan. L., see Eldrup 10 (1971) 379
Kevan, L., see Fueki 10 (1971) 504
Keyser, L.F. and F. Kaufman, Radiative lifetime and collisional quenching of NO_2 fluorescence and nature of the air afterglow 2 (1968) 523
Khan, A.U., see Hagopian 9 (1971) 609
Khandelwal, D.P., see Sarin 6 (1970) 473
Khetrapal, C.L., A.C. Kunwar and C.R. Kanekar, NMR investigations on π-cyclopentadienyl manganese tricarbonyl oriented in the nematic phase 9 (1971) 437
Kibler, M.R., Comparison between the point charge electrostatic model and the Ξ^2 model 7 (1970) 83

Kibler, M.R., Explanation of some casual degeneracies introduced by the Ξ^2 model 8 (1971) 142
Kiefer, W. and H.J. Bernstein, Resonance Raman effect in MnO_4^- with 5145 Å laser excitation 8 (1971) 381
Kielich, S., Multi-harmonic molecular light scattering in liquids 1 (1967) 441
Kielich, S., Strong optical nonlinearities in colloidal systems 1 (1968) 675
Kielich, S., On the relation between non-linear refractive index and molecular light scattering in liquids 2 (1968) 112
Kielich, S., DC electric field-induced optical second harmonic generation by interacting multipolar molecules 2 (1968) 569
Kielich, S. and Z. Przeniczny, Electric saturation of dielectric permittivity variation in macromolecular solutions 6 (1970) 72
Kielich, S., Dielectric saturation in liquids consisting of atoms or nondipolar molecules 7 (1970) 347
Erratum 7 (1970) 639
Kielich, S., Depolarization of light scattering by atomic and molecular solutions with strongly anisotropic translational–orientational fluctuations 10 (1971) 516
Kihara, T. and M.S.Jhon, The core potential of intermolecular forces applied to solubility of gases in liquids 7 (1970) 559
Kihara, T. and J. Okutani, Critical temperature as accumulation point of least zeros of cluster coefficients 8 (1971) 63
Kihara, T., K. Yamazaki, M.S. Jhon and U.R. Kim, Core-potential parameters of intermolecular forces 9 (1971) 62
Kilponen, R.G., see Gill 8 (1971) 634
Kim, S. and D. Henderson, Quantum corrections to the fifth virial coefficient 2 (1968) 619
Erratum 3 (1969) 728
Kim, U.R., see Kihara 9 (1971) 62
Kimbell, G.H., see Arnold 3 (1969) 469
Kimbell, G.H., see Suart 5 (1970) 519
Kimbell, G.H., see Suart 7 (1970) 337
Kimbell, G.H., see Jacobson 8 (1971) 309
Kimel, S., see Speiser 7 (1970) 19
Kinsey, J.L., The density of states for interacting systems with inelastic transitions and its relation to the collision lifetime 8 (1971) 349
Kirby, G.H. and K. Miller, The CNDO geometry of ethylene in the first singlet excited state 3 (1969) 643
Kirmse, R., W. Windsch and E. Hoyer, EPR investigations of copper (II)–bis-(di-*n*-butyl-diselencarbamate) in solution 4 (1970) 565
Kirsch, L.J., see Donovan 6 (1970) 488
Kirsch, L.J., see Donovan 7 (1970) 453
Kirsch, L.J., see Husain 8 (1971) 543
Kirsch, L.J., see Husain 9 (1971) 412
Kirtman, B., The distinguishable electron method for electronic structure calculations 1 (1968) 631
Kistemaker, J., see Knoop 3 (1969) 73
Kitchlew, A., A. Kumar and B. Nageswara Rao, Nuclear magnetic double resonance of a single spin $\frac{1}{2}$ system 2 (1968) 216
Kitrösser, D.F., see Golomb 5 (1970) 101
Kivel, B., see Mandl 5 (1970) 307
Klais, O., see Bennewitz 9 (1971) 19
Klasinc, L. and U. Sommer, A theoretical study of T–T-absorption spectra of 1-and 2-substituted naphthalenes 3 (1969) 107

Klassen, D.M. and G.A. Crosby, Reassignment of the luminescence from ruthenium (III) complexes 1 (1967) 127
Klassen, N.V., see Gillis 10 (1971) 481
Klassen, N.V., see Walker 10 (1971) 636
Klein, M.P., see Nath 2 (1968) 471
Klein, M.P., D. Gill and G. Kotowycz, Deuterium quadrupole coupling constant in CD_2Cl_2 2 (1968) 677
Klein, M.P., see Kramer 8 (1971) 183
Klein, M.P., see Kramer 9 (1971) 88
Klessinger, M., Chemical bond in hydrogen fluoride 2 (1968) 562
Klessinger, M., Bond angle deformation and hybridization in H_2O 4 (1969) 144
Kley, D., see Becker 4 (1969) 62
Kling, R. and J. Schiffer, The potential environment about the water molecule in gypsum 3 (1969) 64
Klompmaker, E.R., see Passchier 4 (1970) 485
Kloosterboer, J.G., see Giling 8 (1971) 457
Kloosterboer, J.G., L.J. Giling, R.P.H. Rettschnick and J.D.W. van Voorst, Flash photolysis of solutions of sodium in ethers 8 (1971) 462
Klöpffer, W., Excimer and monomer fluorescence of 1,3-biscarbazolyl propane 4 (1969) 193
Klöpffer, W. and H. Bauser, Energy transfer in crystalline layers of pyrene 6 (1970) 279
Klöpffer, W., see Bauser 7 (1970) 137
Klopman, G., Solvations: a semi-empirical procedure for including solvation in quantum mechanical calculations of large molecules 1 (1967) 200
Klots, C.E., Yield of resonance states in irradiated argon 2 (1968) 645
Klots, C.E., Ionic fragmentation through centrifugal barriers 10 (1971) 422
Klueger, J., G. Fischer, E. Fischer, Ch. Goedicke and H. Stegemeyer, The fluorescence of the *cis* and *trans* forms of naphthyl-ethylenes 8 (1971) 279
Kneubühl, F., see Keller 9 (1971) 178
Knight, A.E.W. and B.K. Selinger, Time resolution of exciplex formation on a nanosecond scale 10 (1971) 43
Knoop, F.W.E., J. Kistemaker and L.J. Oosterhoff, Low energy electron impact excitation spectra of 1, 3, 5-cycloheptatriene and 1, 3, 5, 7-cyclo-octatraene 3 (1969) 73
Knoop, F.W.E., H.H. Brongersma and A.J.H. Boerboom, A new method to study molecules by electronic impact spectroscopy 5 (1970) 450
Knudsen, J.M., see De Araújo 7 (1970) 333
Knudtson, J.T., see Bates Jr. 8 (1971) 103
Koch, E.E. and A. Otto, Inelastic scattering of 30 keV electrons in vapours of triphenylene, perylene and ferrocene 6 (1970) 15
Koch, E.E. and M. Skibowski, Optical absorption of gaseous methane, ethane, propane and butane and reflection of solid methane and ethane in the vacuum ultraviolet 9 (1971) 429
Koch, E.E., see Haensel 9 (1971) 548
Koch, R.J., see Bingel 1 (1967) 251
Koch, R.J., see Kutzelnigg 2 (1968) 197
Kochanski, E., J.M. Lehn and B. Levy, Nitrogen nuclear quadrupole coupling constants in heterocyclic molecules from ab initio molecular-orbital wavefunctions 4 (1969) 75
Kochanski, E., Calculation of the dispersion contribution to the interaction energy of two hydrogen molecules at large but finite distances 10 (1971) 543
Koenst, J.W., see Eder 3 (1969) 520
Kohl, D.A., see Bonham 4 (1969) 349
Koizumi, M., see Niizuma 7 (1970) 279

Kokubun, H., see Nizuma 7 (1970) 279
Kolker, H.J., The deactivation of the asymmetric stretch mode of carbon dioxide by hydrogen 10 (1971) 498
Koller, J., see Ažman 5 (1970) 157
Kollmann, P.A. and L.C. Allen, The attractive rotational barrier in nitrosomethane 5 (1970) 75
Kollmar, H. and H.O. Smith, The equilibrium geometry and electronic structure of the CH_5 cation calculated with CNDO 5 (1970) 7
Kollmar, H., Semi-empirical MO calculations of hydrocarbon radicals with the half electron method 8 (1971) 533
Kołos, W., Relative location of the triplet and singlet states in H_2 1 (1967) 19
Kołos, W., see Jeziorski 3 (1969) 677
Komarynsky, M.A. and S.L. Weissman, Association between lithium biphenylide and biphenyl 7 (1970) 211
Kominami, S., K. Akasaka, H. Umegaki and H. Hatano, Photo-induced reversible hole-transfer in a γ-irradiated single crystal of N-acetyl DL-methionine: existence of two hole traps in a molecule 9 (1971) 510
Kommandeur, J., see Vegter 3 (1969) 427
Kommandeur, J., see Jonkman 5 (1970) 579
Kommandeur, J., see Drent 8 (1971) 303
Kommandeur, J., see Nitzan 9 (1971) 273
Kompa, K.L., P. Gensel and J. Wanner, New hydrogen fluoride chemical lasers 3 (1969) 210
Kompa, K.L., see Gensel 5 (1970) 179
Kompal. K.L., see Gensel 7 (1970) 583
Konarski, J., Discussion of normal vibrations of polypeptide chain 9 (1971) 54
König, E. and S. Kremer, The lower excited electronic states of singly and doubly reduced 2,2′-bipyridine 5 (1970) 87
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König, E. and S. Kremer, Temperature dependence of the $^5T_2$-$^1A_1$ energy separation at the ground state crossover in $[Fe^{II}\text{-}N_6]$ complexes 8 (1971) 312
König, E., Exchange interaction and simultaneous pair excitation in an oxygen-bridged chromium(III) complex 9 (1971) 31
Koningsberger, D.C. and T. de Neef, ESR investigations on liquid sulphur and selenium 4 (1970) 615
Koningsberger, D.C., J.H.M.C. van Wolput and P.C.U. Rieter, ESR measurements on the polymerization of liquid selenium 8 (1971) 145
Koningstein, J.A., see Sonnich Mortensen 1 (1967) 409
Koningstein, J.A. and O. Sonnich Mortensen, On the electronic Raman scattering tensor of the trivalent cerium ion in a hexagonal crystal field 1 (1968) 693
Koningstein, J.A., Depolarization ratio of overtone and combination bands of the vibrational Raman effect 2 (1968) 31, 126
Koningstein, J.A., Observation of electronic Raman transitions of the terbium ion 2 (1968) 213
Koningstein, J.A., On the inner and outer scattering tensor for vibrational Raman effect 2 (1968) 469
Koningstein, J.A., A comparison of far infrared and Raman spectra of some rare earth garnet single crystals 3 (1969) 303
Koningstein, J.A. and G. Mace, A Zeeman–Raman experiment 8 (1969) 443
Koningstein, J.A. and P. Grunberg, The effect of strong crystal fields on the selection rules of electronic Raman transitions 6 (1970) 320
Koningstein, J.A., see Azima 7 (1970) 565
Konornicki, A., see McIver Jr. 10 (1971) 303
Konowalow, D.D., Comment on the modified Buckingham, Carrà, Konowalow potential for nonpolar molecules 2 (1968) 179

Koo, J. and Y.-N. Hsieh, ^{14}N nuclear quadrupole coupling constants in imidazole 9 (1971) 238
Koob, R.D., see Dhingra 9 (1971) 17
Koren, J.G., see Brinen 2 (1968) 671
Koskikallio, J., A.B. Callear and J.H. Connor, Deuterium isotope effects in the attachment of $Hg(6^3P_0)$ to ammonia, and measurements of the lifetimes of stabilised complexes 8 (1971) 467
Kostikas, A., see Simopoulos 7 (1970) 615
Kosuch, N., see Haensel 9 (1971) 548
Kottis, Ph., see Le Fahler 4 (1970) 491
Kottis, Ph., see Le Fahler 5 (1970) 188
Kottis, Ph., The triplet exciton states of molecular aggregates embedded in an amorphous solid matrix: the temperature effect 6 (1970) 133
Kotowycz, G., see Klein 2 (1968) 677
Koutecký, J., Possible reinterpretation of the Pariser–Parr–Pople theory 1 (1967) 249
Koutecký, J. and V. Bonačič, Direct minimization of Hartree–Fock energy for alternant hydrocarbons in the PPP model 10 (1971) 401
Koyanagi, M., R. Zwarich and L. Goodman, Optical studies of the $^3(n, \pi^*)$ magnetic sublevels in benzaldehyde 9 (1971) 74
Koyanagi, M. and L. Goodman, Vibronic structure of benzaldehyde $^3(n, \pi^*)$ phosphorescence 9 (1971) 636
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Kraemer, W.P. and G.H.F. Diercksen, SCF MO LCGO studies on hydrogen bonding. The system $(H_2OHOH_2)^+$ 5 (1970) 463
Kraemer, W.P., see Diercksen 5 (1970) 570
Kraemer, W.P., see Diercksen 6 (1970) 419
Kramer, L.N. and M.P. Klein, Application of extended Hückel theory to X-ray photoelectron spectra of transition metal complexes. Correlations between electron binding energy and calculated atomic charge in iron and sulphur compounds 8 (1971) 183
Erratum 9 (1971) 88
Krause, M.O., see Carlson 5 (1970) 390
Krause, M.O., The Mζ X-rays of Y to Rh in photoelectron spectrometry 10 (1971) 65
Krause, R.A., I. Trabjerg and C.J. Ballhausen, The excited state absorption spectrum of a chromium (III) complex 3 (1969) 297
Kravchenko, E.A., see Buslaev 3 (1969) 455
Krawetz, B., see Gregg 8 (1971) 609
Krebs, P., see Sackmann 4 (1969) 65
Krebs. P., E. Sackmann and J. Schwarz, Triplet ESR-spectra of charge-transfer complexes in liquid and single crystals 8 (1971) 417
Kreilick, R., see Hatch 10 (1971) 490
Kreilick, R.W., Electron spin resonance studies of a mixed phenoxy-nitroxide biradical 2 (1968) 277
Krell, J., Ch. Zuhrt and L. Zülicke, Bond-orbital calculations for CH_4, NH_3 and H_2O 4 (1969) 261
Kremer, S., see König 5 (1970) 87
Kremer, S., see König 8 (1971) 312
Krenos, J., R. Preston, R. Wolfgang and J. Tully, Reaction of hydrogen atomic ions with hydrogen molecules: experiment, ab initio theory and a conceptual model 10 (1971) 17
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Krishnan, M.V. and V.D. Gupta, Vibration spectra of alpha-helix of poly-alanine 6 (1970) 231

Krishnan, M.V., see Gupta 6 (1970) 317
Krishnan, M.V. and V.D. Gupta, Dispersion curves of poly-alanine in the β-form 7 (1970) 285
Kristianpoller, N., see Chen 7 (1970) 171
Kroh, J. and J. Mayer, γ-radiolysis of the ethanol–benzene system at −196°C in the presence of electron scavengers 1 (1967) 191
Kroh, J. and E. Hankiewicz, Radiation and photochemically induced tritium substitution in aromatic hydrocarbons 1 (1968) 542
Kroll, M. and D. Swanson, The resonance fluorescence fo I_2 excited by a single mode laser 9 (1971) 115
Kroon, S.G. and J. van der Elsken, Rotation-translation spectra of polar molecules in liquids 1 (1967) 285
Kropp, J.L. and C.C. Stanley, The temperature dependence of ovalene fluorescence 9 (1971) 534
Kuan, T.S., D.S. Tinti and M.A. El-Sayed, Optical detection of electron–electron double resonance (EEDOR) in zero field of the triplet state 4 (1970) 507
Kuck, V.J., see Wasserman 7 (1970) 409
Kuhn, H. and A. Schweig, Theoretical treatment of solvent effects on the electronic spectra of polar organic dye molecules 1 (1967) 255
Kuhn, H., see Bücher 3 (1969) 508
Kuhn, H., see Czikkely 6 (1970) 11, 207
Kuhn, H., see Bücher 6 (1970) 183
Kuhn, H., see Inacker 7 (1970) 213
Kuhn, H., see Mann 8 (1971) 82
Kukolich, S.G., Magnetic susceptibility anisotropy and molecular quadrupole moment in $^{14}NH_3$ 5 (1970) 401
Kukolich, S.G. and W.H. Flygare, The molecular Zeeman effect in PH_2D and PHD_2 and the molecular *g*-values, magnetic susceptibilities, and molecular quadrupole moment in PH_3 7 (1970) 43
Kukolich, S.G., Nitrogen quadrupole coupling and spin–rotation interaction in CH_3NC 10 (1971) 52
Kulshreshtha, A.P., see Mookherji 6 (1970) 423
Kulshreshtha, A.P., see Özer 10 (1971) 204
Kumar, A., see Kitchlew 2 (1968) 216
Kündig, W., see Nath 2 (1968) 471
Kuntz, P.J., Ion–molecule reaction dynamics. A comparison of two direct interaction models 4 (1969) 129
Kunwar, A.C., see Khetrapal 9 (1971) 437
Kuppermann, A., see Riley 1 (1968) 537
Kuppermann, A., see Trajmar 1 (1968) 703
Kuppermann, A., see Truhlar 9 (1971) 269
Kuri, Z., see Noda 8 (1971) 407
Kurland, R.J., see Ray 2 (1968) 324
Kuse, D. and Chr.K. Jørgensen, Angular overlap treatment of erbium(III) in xenotime and yttrium orthovanadate 1 (1967) 314
Kutzelnigg, W., R. Ahlrichs, I. Labib-Iskander and W.A. Bingel, The Hartree–Fock and the correlation energies of the H_3^+ ion and their dependence on the nuclear configuration 1 (1967) 447
Kutzelnigg, W., see Ahlrichs 1 (1968) 651
Kutzelnigg, W., R.J. Koch and W.A. Bingel, Simulation of the influence of the core electrons by a pseudopotential. I. Atoms with one and two valence electrons 2 (1968) 197
Kutzelnigg, W., Simulation of the influence of the core electron by a pseudopotential. III. Calculation of the van der Waals forces between alkali atoms 4 (1969) 435
Kutzelnigg, W., A relation between the angular moments of natural orbitals and natural geminals 4 (1969) 449
Kutzelnigg, W., see Dyczmons 5 (1970) 361

Kutzelnigg, W. and M. Gelus, Potential curve of the Li_2 ground state for large internuclear distances. A contribution to the understanding of interatomic forces 7 (1970) 296
Kutzelnigg, W., see Gelus 7 (1970) 503
Kuzmin, M.G. and L.N. Guseva, Donor-acceptor complexes of singlet excited states of aromatic hydrocarbons with aliphatic amines 3 (1969) 71
Kvasnička, V., see Vojtik 9 (1971) 323
Kwan, C.L., see Levanon 6 (1970) 19
Kwiram, A.L., Optical detection of paramagnetic resonance in phosphorescent triplet states 1 (1967) 272
Kwiram, A.L., see Liang-Tsai Cheng 4 (1969) 457
Kydd, R.A., see Bree 3 (1969) 357

Labib-Iskander, I., see Kutzelnigg 1 (1967) 447
Labhart. H., On the temperature dependence of rate constants 1 (1967) 263
Labhart, H., see Seibold 3 (1969) 275
Labhart, H., see Heinzelmann 4 (1969) 20
Labhart, H., see Wyrsch 8 (1971) 217
Lacmann, K. and D.R. Herschbach, Collisional excitation and ionization of K atoms by diatomic molecules: role of ion-pair states 6 (1970) 106
Ladd, J.A., see Orville-Thomas 6 (1970) 629
Ladner, R.C., see Blint 5 (1970) 302
Laferriere, A., see Winter 6 (1970) 175
Lagendijk, A., N.F.M. Tromp, M. Glasbeek and J.D.W. van Voorst, ENDOR in solutions of mononegative ions of aromatic hydrocarbons 6 (1970) 152
Lahajnar, G., see Blinc 4 (1969) 363
Laj, C., see Dubois 6 (1970) 227
Lalita, K. and M. Bloom, Proton spin relaxation in methane gas and methanehelium gas mixtures 8 (1971) 285
Lamanna, U., see Gianturco 6 (1970) 326
Lamanna, U., see Gianturco 10 (1971) 269
LaMar, G.N., see Edelstein 8 (1971) 399
LaMar, G.N., The effect of paramagnetic metal ions on proton-decoupled C-13 NMR intensities 10 (1971) 230
Lambooy, A.M.F., see Langelaar 1 (1968) 609
Lancelot, G. and G. Hélène, Spin–orbit coupling in sulphur-containing purine and pyrimidine derivatives. A comparison of caffeine and 6-thiocaffeine 9 (1971) 327
Erratum 10 (1971) 88
Land, E.J., see Lavalette 10 (1971) 331
Landman, U., Double perturbation method on LCAO–SCF functions 1 (1967) 289
Landman, U., see Friedmann 1 (1967) 477
Landman, U. and R. Pauncz, Remarks on projection operators used in the theory of intermolecular interactions 9 (1971) 489
Lane, N.F., see Cohen 10 (1971) 623
Langelaar, J., R.P.H. Rettschnick, A.M.F. Lambooy and G.J. Hoytink, Monomer and excimer phosphorescence of phenanthrene and naphthalene in solution 1 (1968) 609
Langelaar, J., see Gijzeman 5 (1970) 269
Langelaar, J., J. Wegdam-van Beek, J.D.W. van Voorst and D. Lavalette, Polarization measurements of low-lying T–T absorptions with CW argon-ion laser photoselection 6 (1970) 460
Langelaar, J., J. Wegdam-van Beek, H. ten Brink and J.D.W. van Voorst, The location, polarization and assignment of low lying excited triplet states in pyrene 7 (1970) 368

Langelaar, J., see Werkhoven 9 (1971) 6
Langelaar, J., see Lavalette 9 (1971) 230, 319
Langelaar. J., see Post 10 (1971) 468
Langhoff, P.W., Bounds for second-order optical properties from quantum-mechanical sum rules and the theory of moments 9 (1971) 89
Laor, U., see Hsieh 10 (1971) 412
Laposa, J.D. and H. Singh, Effect of partial and complete deuteration on the phosphorescence lifetime of phenylacetylene 4 (1969) 288
Larcom, L.L., see Ellison 10 (1971) 580
Larkin, I.W., see Boness 1 (1967) 292
Larkin, I.W. and J.B. Hasted, Interaction of electrons with N_2O and CO_2 5 (1970) 325
Larsson, S., A method of obtaining Brueckner orbitals for atoms and molecules 7 (1970) 165
Larsson, S., The UHF method and the calculation of $\langle r_x^{-3} \rangle$ parameters for the lowest P-states of the second period of atoms 10 (1971) 162
Lassier, B. and C. Brot, Inertial effects in discrete sites model of rotational freedom. Auto-correlation function and dipolar absorption 1 (1968) 581
Lassier, B., C. Brot, G.W. Chantry and H.A. Gebbie, Far infrared absorption spectra of methyl-chloroform in its plastic and truly crystalline phases 3 (1969) 96
Lathan, W.A., W.J. Hehre and J.A. Pople, Molecular orbital dissociation energies for small hydrocarbons 3 (1969) 579
Latourrette, J.T., see Jung 5 (1970) 67
Laughlin, C., see Amos 3 (1969) 411
Laurenzi, B.J., Green's functions in atomic and molecular calculations 1 (1968) 641
Laurenzi, B.J., Continuum contribution to the helium atom's Green function 5 (1970) 3
Lavalette, D., Polarized excitation spectrum of the triplet–triplet absorption of aromatic hydrocarbons 3 (1969) 67
Lavalette, D., A correlation between SCF MO and HMO calculations of triplet–triplet absorption spectra of alternant hydrocarbons 3 (1969) 264
Lavalette, D., see Langelaar 6 (1970) 460
Lavalette, D., C.J. Werkhoven, D. Bebelaar, J. Langelaar and J.D.W. van Voorst, Excited singlet state polarization and absorption spectra of 1,2-benzcoronene, 1,12-benzperylene and 1,2:3,4-dibenzanthracene 9 (1971) 230
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Lawrence, G.M., Quenching and radiation rates of $CO(a^3\Pi)$ 9 (1971) 575
Laws, E.A., R.M. Stevens and W.N. Lipscomb, Theoretical determination of the magnetic properties of diatomic AlH 4 (1969) 159
Lawson, T., see Tench 7 (1970) 459
Lawson, T., see Tench 8 (1971) 177
Leach, S. and E. Migirdicyan, On the electronic spectra of the duryl radical and the origin of the green emission of durene 1 (1967) 21
Lebeda, C.F. and D.M. Schrader, Perturbation calculations without H^0 or H^1 2 (1968) 91
Lebeda, C.F. and D.M. Schrader, A variational approach to FOPIM 2 (1968) 389

Lebeda, C.F., see Choi 5 (1970) 503
Lechner, R.E., J.M. Rowe, K. Sköld and J.J. Rush, Study of molecular reorientation in solid neopentane by quasielastic neutron scattering 4 (1969) 444
Leclercq, J.M., see Meyer 4 (1970) 587
Leder, L., see Adams 6 (1970) 90
Leder, L.B., On some liquid crystal properties of cholesteryl 2-(2-ethoxyethoxy) ethyl carbonate and related compounds 6 (1970) 285
Lee, J., see Matheson 7 (1970) 475
Lee, J., see Matheson 8 (1971) 173
Lee, J. and F.P. Temme, A generalisation of the superoperator method of spectral analysis in nuclear magnetic resonance 10 (1971) 251
Lee, J.S., see Fink 4 (1969) 347
Lee, S.K., see Ware 2 (1968) 356
Lee, S.M., L.A. Gamss and A.M. Ronn, Passive Q-switching of a CO_2–N_2–He laser with ethylene 7 (1970) 463
Lee, Y.-T., F.H. Ree and T. Ree, Virial coefficients from the hard-disk radial distribution function 4 (1969) 379
Lee, Y.-T., see Tully 9 (1971) 80
Leech, J.W. and C.J. Peachey, Frequency distribution of phonons in the low temperature phase of solid HCl 1 (1968) 643
Le Fahler, J.P., J.P. Lemaistre and Ph. Kottis, Multi-channel transfer model for triplet excitons in aromatic compounds 4 (1970) 491
Erratum 5 (1970) 188
Lefebvre, R. and R. Prat, On the projection of Slater determinants 1 (1967) 388
Lefebvre, R. and J. Savolainen, Photon echoes with molecules undergoing intramolecular radiationless transitions 3 (1969) 449
Lefebvre, R., Preparation of the decay of initial states in intramolecular radiationless processes 8 (1971) 306
Lefebvre, R., see Ressayre 8 (1971) 553
Lefebvre-Brion, H., Intensity anomaly in the photoelectron spectrum of NO 9 (1971) 463
Legay, F., see Abouaf-Marguin 7 (1970) 61
Leger, L.J. and G.G. Meisels, Preferred dipole orientation in ion–polar molecule reactions 1 (1968) 661
Legros, J.-C., W.A. van Hook and G. Thomaes, Convection and thermal diffusion in a solution heated from below 1 (1968) 696
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Lehn, J.M., see Kochanski 4 (1969) 75
Leite, M.S.S.C. and K.R. Naqvi, Intermolecular quenching of the second excited state of some aromatic molecules 4 (1969) 35
Erratum 4 (1970) 590
Le-Khac Huy, W. Forst, J.A. Franklin and G. Huybrechts, Decomposition of chemically activated monochloroethyl radicals 3 (1969) 307
Lemaire, H., A Rassat and P. Rey, Nitroxides XXX: sign of a long-range coupling in a bicyclic nitroxide radical 2 (1968) 573
Lemaistre, J.P., see Le Fahler 4 (1970) 491

LeMaistre, J.P., see Le Fahler 5 (1970) 188
Lempert, G.D., J.F. Wilson and S.J.B. Corrigan, Velocity dependence of the total cross section for helium–argon, neon–krypton and neon–xenon scattering 8 (1971) 67
Leniart, D.S., J.C. Vedrine and J.S. Hyde, Liquid phase nitrogen ENDOR in nitroxide radicals 6 (1970) 637
Leonas, V.B., see Belyaev 1 (1967) 375
Leonas, V.B. and A.A. Pyarnpuu, Hydrogen-atom scattering: a direct comparison of measured and computed scattering cross sections for molecular hydrogen 5 (1970) 567
Leonas, V.B., A.V. Sermyagin and N.V. Kamyshov, The short-range interaction of molecules: the experimental investigation of potential energy surfaces 8 (1971) 282
Lepoutre, G., see Duval 2 (1968) 237
Leribaux, H.R. and N.K. Pope, Green's function approximation for an equation of state describing liquid–gas phase transitions 6 (1970) 447
Leribaux, H.R., A new pair potential for sodium vapor for virial coefficient data 7 (1970) 112
Leroy, G., see André 3 (1969) 695
Leroy, G., see André 5 (1970) 71
Leroy, G., see André 8 (1971) 195
Le Roy, D.J., see Mintz 10 (1971) 280
LeRoy, R.J. and R.B. Bernstein, Dissociation energies of diatomic molecules from vibrational spacings of higher levels: application to the halogens 5 (1970) 42
Lessing, H.E., E. Lippert and W. Rapp, Fluorescene decay of laser-excited organic molecules 7 (1970) 247
Lester Jr., W.A. and R.B. Bernstein, Structural features of the *S*-matrix for the rotational excitation of homonuclear diatomic molecules by atom impact: close-coupled versus approximate computations 1 (1967) 207, 347
Lester Jr., W.A., see Johnson 1 (1967) 396
Levanon, H., C.L. Kwang and S.I. Weissman, Direct observations of growth of magnetization in excitation of triplet states 6 (1970) 19
Levanon, H., Localization of triplet exciton in dibenzoylmethane chelates 9 (1971) 257
Levanon, H. and S.I. Weissman, Interaction of long wavelength light with phemanthrene triplets in crystalline benzophenone 10 (1971) 25
Levi, G., see Chalaye 8 (1971) 337
Levin, E., M. Pope, D. Saperstein and G.K. Oster, The role of $CHCl_3$ as a quencher for γ and UV excited organic solutions 9 (1971) 210
Levin, I.W. and S. Abramowitz, Isotopic splitting in matrix isolated BF_3 9 (1971) 247
Levine, R.D., B.R. Johnson, J.T. Muckerman and R.B. Bernstein, Internal excitation in non-reactive molecular collisions: resonances in elastic scattering of atoms by diatomic molecules 1 (1968) 517
Levine, R.D., On the distorted-wave magnus approximation in non-reactive molecular collision 2 (1968) 76
Levine, R.D., M. Shapiro, J.T. Muckerman and B.R. Johnson, Rotational excitation in molecular collisions:exact (two-state) results versus variational (decoupling) computations 2 (1968) 545
Levine, R.D., see Johnson 3 (1969) 131
Levine, R.D., Opacity analysis of inelastic molecular collisions. I. The quantum mechanical sudden approximation 4 (1969) 211
Levine, R.D., Opacity analysis of inelastic molecular collisions. III. The conservation of the total cross section 4 (1969) 309
Levine, R.D. and B.R. Johnson, Rotational excitation in molecular collisions: statistical features of the *S*-matrix 4 (1969) 365
Levine, R.D., see Shapiro 5 (1970) 499
Levine, R.D. and G.G. Balint-Kurti, Opacity analysis of inelastic molecular collisions. Exponential approximations 6 (1970) 101

Levine, R.D., see Balint-Kurti 7 (1970) 107
Levine, R.D., see Shapiro 7 (1970) 156
Levine, R.D., see Johnson 7 (1970) 268
Levine, R.D. and B.R. Johnson, On the classical and semiclassical limits in collision theory 7 (1970) 404
Levine, R.D. and B.R. Johnson, A theory of vibrational excitation in the near classical limit 8 (1971) 501
Levine, R.D., see Hofacker 9 (1971) 617
Levine, R.D., F.A. Wolf and J.A. Maus, On the energy distribution of final products in molecular collisions 10 (1971) 2
Levine, R.D., Radiationless transitions and population inversions: two examples of internal conversion 10 (1971) 510
Levrushko, A.G., see Babenko 8 (1971) 598
Levstek, I., see Lavrenčič 5 (1970) 441
Levy, B., Multi-configuration self-consistent wavefunctions of formaldehyde 4 (1969) 17
Levy, B., see Kochanski 4 (1969) 75
Levy, P.M., Permutation degeneracy in the presence of large spin–orbit coupling 3 (1969) 556
Lhoste, J.M., see Grivet 3 (1969) 445
Li, N.C., see Ruby 2 (1968) 39
Li, Y.H., see Lim 4 (1969) 25
Li, Y.H. and E.C. Lim, Vibronic perturbation of the lowest triplet state and phosphorescence of aromatic ketones 7 (1970) 15
Li, Y.H. and E.C. Lim, Pseudo Jahn–Teller effect and luminescence of nitrogen heterocyclic compounds 9 (1971) 279
Li, Y.H. and E.C. Lim, Radiationless transitions in monocyclic diazines 9 (1971) 514
Lifshitz, C., B.M. Hughes and T.O. Tiernan, Electron affinities from endothermic negative-ion charge-transfer reactions NO_2 and SF_6 7 (1970) 469
Lifson, S., see Warshel 4 (1969) 255
Lilley, D.M.J., see Clark 9 (1971) 234
Lim, E.C. and S.K. Chakrabarti, Intramolecular charge-transfer transitions and spin–orbit coupling in the heteroaromatic molecules 1 (1967) 28
Lim, E.C. and Y.H.Li, Non-planar vibrations and radiationless molecular electronic transitions in nitrogen heterocyclic and aromatic carbonyl compounds 4 (1969) 25
Lim, E.C. and Y.H. Li, Non-planar distortions of, and polarization of luminescence from, $\pi\pi^*$ states of some nitrogen heterocyclic compounds 4 (1969) 68
Lim, E.C. and J. Stanislaus, Polarization of phosphorescence in nitroaromatics 6 (1970) 195
Lim, E.C., see Li 7 (1970) 15
Lim, E.C., see Uy 7 (1970) 306
Lim, E.C. and H.R. Bhattacharjee. "Inverse" deuterium isotope effect in radiationless electronic transitions. Singlet→triplet intersystem crossing in anthracene 9 (1971) 249
Lim, E.C., see Li 9 (1971) 279, 514
Lim, T.K., Lower bounds to the exact energy 4 (1969) 461
Lim, T.K., Some properties of the reduced Hamiltonians and their applications 4 (1970) 521
Lin, J., K. Tsuji and F. Williams, ESR studies on the stability of trapped electrons in photoionized and gamma-irradiated organic glasses 1 (1967) 66
Lin, M.C., HCl chemical laser from H + Cl_2O 7 (1970) 209
Lin, M.C. and S.H. Bauer, A chemical CO laser 7 (1970) 223
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Lindberg, B., see Hamrin 1 (1968) 557

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Lindberg, J., Consistency requirement in the Pariser–Parr–Pople model 1 (1967) 39
Linderberg, J. and Y. Öhrn, Improved decoupling procedure for Green functions 1 (1967) 295
Linderberg, J. and Y. Öhrn, Tight-binding model for the energy bands in solids 3 (1969) 119
Linderberg, J., see Pyykkö 5 (1970) 34
Linderberg, J., Use of contour integral method in molecular orbital theory 5 (1970) 134
Linderberg, J. and M. Ratner, Geometric approximation to two-particle Green function for ethylene 6 (1970) 37
Linderberg, J., see Oddershede 8 (1971) 165
Linderberg, J., see Thulstrup 9 (1971) 485
Lindgren, B., see Bollmark 1 (1967) 480
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Lindholm, E. and B.-Ö. Jonsson, The electronic structure of benzene 1 (1967) 501
Lindholm, E., see Åsbrink 5 (1970) 192, 609
Lindman, B., see Lindblom 8 (1971) 489
Lippert, E., see Lessing 7 (1970) 247
Lippincott, E.R., see Brasch 2 (1968) 99
Lippmaa, E., T. Pehk, A.L. Buchachenko and S.V. Rykov, Chemically induced dynamic nuclear polarization of ^{13}C nuclei in the thermal decomposition of organic peroxides 5 (1970) 521
Lippmaa, E., see Saluvere 7 (1970) 545
Lipscomb, W.N., see Laws 4 (1969) 159
Lipscomb, W.N., see Epstein 4 (1970) 479
Lipscomb, W.N., see Halgren 8 (1971) 547
Lipsicas, M., see Siegel 6 (1970) 259
Lipsky, S., see Hirayama 5 (1970) 296
Lischka, H., Th. Plesser and P. Schuster, LCAO MO SCF calculations on the hydration of simple ions (LCAO MO studies on molecular structure V) 6 (1970) 263
Little, W.A., see Gutfreund 2 (1968) 589
Liu, C.F., see Dagg 3 (1969) 377
Llabador, Y. and J.M. Friedt, Mössbauer study of the after-effects of ^{119m}Sn isomeric transition in $^{119m}Sn : SnO_4$ 8 (1971) 592
Lloyd, D.R., see Bassett 3 (1969) 22
Lloyd, D.R., see Bassett 6 (1970) 166, 253
Lloyd, R.V., see Ferrell 9 (1971) 343
Lo, D.H., see Boyd 2 (1968) 227
Locht, R. and J. Momigny, Mass spectrometric determination of the electron-affinities of radicals 6 (1970) 273
Lockwood, D.J., see Christie 8 (1971) 120
Lockwood, D.J. and J.H. Christie, Electronic Raman spectra of Co^{2+} in $CdCl_2$, $CdBr_2$ and $MnCl_2$ 9 (1971) 559
Loehr, T.M., J. Zinich and T.V. Long II, The laser-Raman spectra of hexaaminecobalt (III), chloropentaaminecobalt (III), and transdichlorotetraaminecobalt (III) 7 (1970) 183
Loewenthal, E., Y. Tomkiewicz and A. Weinreb, An effect of concentration and excitation wavelength on the emission spectrum of pyrene monomer 2 (1968) 29
Loewenthal, E., see Bodenheimer 3 (1969) 715

Lohmann, F., Chemical free energies of solvation of single ions in different solvents and the hard–soft classification 2 (1968) 659
Lokan, K.H., see Gillis 10 (1971) 481
Lombardi, E., see Jansen 1 (1967) 33, 417
Lombardi, E. and R. Ritter, Influence of short-range three-ion interactions on polymorphism and elastic constants of alkaline-earth–chalcogenide crystals 7 (1970) 143
Lombos, B.A., P. Sauvageau and C. Sandorfy, The electronic spectra of normal paraffin hydrocarbons 1 (1967) 42
Lombos, B.A., P. Sauvageau and C. Sandorfy, The far-ultraviolet spectra of branched chain paraffins 1 (1967) 221
Lombos, B.A., P. Sauvageau and C. Sandorfy, Far ultraviolet spectra of solid films of methane, ethane and propane 1 (1967) 382
LoMenzo, J.A., B.D. Bird, G.A. Osborne and P.J. Stephens, Detection and assignment of weak absorption bands by magnetic circular dichroism : spin-forbidden transitions of $CoCl_4^{2-}$ 9 (1971) 332
Long, C.A. and G.E. Ewing, The infrared spectrum of bound state oxygen dimers in the gas phase 9 (1971) 225
Long II, T.V., see Loehr 7 (1970) 183
Lorquet, J.C., see Momigny 1 (1967) 455
Lorquet, J.C., see Momigny 1 (1968) 505
Lorquet, J.C. and C. Cadet, Configuration interaction intensity borrowing in photoelectron spectroscopy 6 (1970) 198
Los, J., see Baede 3 (1969) 530
Los, J., see Fournier 9 (1971) 426
Low, W., see Bodenheimer 3 (1969) 715
Lu, P., Fractional order Bessel function approximations to both attractive and repulsive Coulomb scattering 9 (1971) 207
Luckhurst, G.R., see Francis 3 (1969) 213
Luckhurst, G.R. and G.F. Pedulli, Linewidth variations in the solution electron resonance spectra of manganous ions 7 (1970) 49
Luckhurst, G.R., The alignment of cybotactic groups in a nematic mesophase by an electric field 9 (1971) 289
Ludmer, Z., see Cohen 7 (1970) 486
Ludwig, P.K., see Hsieh 10 (1971) 412
Lugli, G., see Paladino 5 (1970) 15
Lukashevich, I.I., see Dézsi 2 (1968) 665
Lukman, B., see Goscinski 7 (1970) 573
Lumb, M.D., see Al-Wattar 8 (1971) 331
Lunsford, J.H., see Williamson 9 (1971) 33
Lüttke, W., see Orville-Thomas 6 (1970) 629
Lyons, L.E., see Johnston 2 (1968) 489
Lyons, L.E. and M.G. Sceats, Polarization energies and quasi-free electron states of rare gas crystals 6 (1970) 217

Maas, G.A., see Visser 2 (1968) 312
Macalady, D.L. and R.G. Barnes, Nuclear magnetic resonance in the pure quadrupole regime: the spin 5/2 case 5 (1970) 186
MacDonald, R.G., see Anlauf 1 (1968) 619
MacDonald, R.G., see Curran 8 (1971) 451

Mace, G., see Koningstein 3 (1969) 443
Mackey, P.H., see Hirst 3 (1969) 255
Maclagan, R.G.A.R., A new approach to the definition of the effective atomic-charge calculated from molecular wavefunctions 8 (1971) 114
MacLean, C., see Hilbers 2 (1968) 445
MacLean, C., see van der Kooy 3 (1969) 12
MacLean, C., see De Jong 5 (1970) 424
MacLean, C., see Bulthuis 7 (1970) 242
MacLean, C., see Hilbers 7 (1970) 587
Maestro, M., see Arrighini 1 (1967) 242
Maestro, M., see Arrighini 7 (1970) 351
Magee, J.L., see Dugan Jr. 2 (1968) 219
Magee, J.L., see Dugan Jr. 3 (1969) 323
Magee, J.L., see Dugan Jr. 6 (1970) 158
Maggiora, G.M., see Christoffersen 3 (1969) 419
Magnasco, V. and G.F. Musso, On factors contributing to rotational barriers 9 (1971) 433
Mahajan, M. and B.D. Nageswara Rao, Motional narrowing of ^{19}F nuclear magnetic resonance in lead fluoride 10 (1971) 29
Maier II, W.B., see Murad 7 (1970) 624
Mainusch, K,-J., see Stegemeyer 6 (1970) 5
Mainusch, K.-J., see Stegemeyer 8 (1971) 425
Majorino, G.F. and A. Nava, Molecular calculations through local series expansions 7 (1970) 420
Erratum 9 (1971) 88
Maker, P.D., see Verdieck 7 (1970) 219
Maki, A.H., see Tinti 3 (1969) 343
Maki, A.H., see Harris 4 (1969) 469
Maki, A.H., see Buckley 4 (1970) 592
Makkes van der Deijl, G., see Drent 2 (1968) 526
Malathi, N. and S.P. Puri, Goldanskii–Karyagin effect in isonitrile complex: $[(C_6H_5CH_2NC)_4 \cdot Fe(CN)_2]$ 10 (1971) 154
Malerich, C.J., see Cross Jr. 2 (1968) 481
Mali, M., see Blinc 9 (1971) 85
Malley, M.M. and P.M.Rentzepis, Picosecond molecular relaxation displayed with crossed laser beams 3 (1969) 534
Malley, M.M. and P.M. Rentzepis, Picosecond time-resolved stimulation light emission 7 (1970) 57
Malm, S.M., see Buckingham 1 (1967) 143
Malrieu, J.P., see Diner 2 (1968) 319
Maltz, C., Polarizable-ion model for vibrationally excited alkali halides 3 (1969) 707
Maltz, C., Barrier to complex formation in the hydrogen atom–chlorine molecule reaction 9 (1971) 251
Mandel, M., see Passchier 4 (1970) 485
Mandel, M., see Passchier 7 (1970) 521
Mandl, A., E.W. Evans and B. Kivel, Electron detachment from F^- ion in a shock-heated cesium fluoride–argon mixture 5 (1970) 307
Mandl, F., see Bardsley 1 (1967) 359
Mann, B., H. Kuhn and L.v. Szentpály, Tunnelling through a fatty acid monolayers and its relevance to photographic sensitization 8 (1971) 82
Mann, J.B., see Penneman 8 (1971) 321
Manne, R., see McCubbin 2 (1968) 230

Manne, R., On the assignment of the carbon tetrafluoride photoelectron spectrum 5 (1970) 125
Manne, R. and T. Aberg, Koopmans' theorem for inner-shell ionization 7 (1970) 282
Manninen, S., see Inkinen 9 (1971) 639
Mansfield, P. and K.H.B. Richards, NMR resolution of the chemical shift in solid Zn_3P_2 3 (1969) 169
Erratum 6 (1970) 123
Manson, S.T. and D.J. Kennedy, Angular distribution of photoelectrons in argon and xenon 7 (1970) 387
Mansour, S. and A. Weinreb, On the decay pattern of solid solutions of anthracene in naphthalene 2 (1968) 653
Mantione, M.J. and J.P. Daudey, A microscopic model for the calculation of solvent effects on molecular electronic spectra. Transition energy shifts and polarizabilities of excited states of benzene 6 (1970) 93
Marchetti, A.P., see Hochstrasser 1 (1968) 597
Marcus, R.A., Extension of the WKB method to wavefunctions and transition probability amplitudes (*S*-matrix) for inelastic or reactive collisions 7 (1970) 525
Marechal, Y., see Zelsmann 6 (1970) 513
Mares, F., see Edelstein 8 (1971) 399
Margulies, L., see Yogev 8 (1971) 157
Maria, H.J., see Rabalais 3 (1969) 59
Maricle, D.L. and A.H. Maurer, Electrochemistry of excited states 2 (1968) 602
Marino, R.A. and T. Oja, Nuclear quadrupole resonance in 4-coordinated nitrogen compounds 4 (1970) 489
Marquard, J., see Aurich 8 (1971) 91
Marrs, J.M. and M. Kasha, Observation of simultaneous electronic transitions for rare-earth ion pairs in aqueous solution 6 (1970) 235
Marrs, J.M., see Hagopian 9 (1971) 609
Märtensson, O., see Brändas 3 (1969) 315
Martin, D.H., see Dean 1 (1967) 415
Martin, D.H., see Platt 1 (1968) 659
Martin, M. and S.A. Rice, Energy trapping in solid He, Ne, Ar, Kr, and Xe by molecule formation – a theoretical interpretation 7 (1970) 94
Martin, R.L. and S. Mitra, Paramagnetic anisotropy and ground state of β-cobalt(II) phthalocyanine 3 (1969) 183
Martin, R.L., see Gregson 5 (1970) 310
Martin, R.M., A simple bond charge model for vibrations in covalent crystals 2 (1968) 268
Martin, R.M., see Doemeny 4 (1969) 302
Martin, T.E. and A.H. Kalantar, Radiationless decay processes in some alkyl aromatics 1 (1968) 623
Martin, T.E. and A.H. Kalantar, Radiationless processes of alkyl aromatic triplet states at 77°K: The unimportance of alkyl hydrogens 4 (1969) 235
Martini, G., see Burlamacchi 9 (1971) 420
Maruani, J., On anisotropic saturation of ESR lines in molecular triplet states 7 (1970) 29
Marx, R., see Bonazzola 8 (1971) 413
Mason, E.A. and S.I. Sander, Thermal separation of the ortho and para forms of H_2 and D_2 6 (1970) 620
Mason, E.H., see Hahn 9 (1971) 633
Mason, S.F. and B.J. Norman, Exciton splittings in the ligand ultraviolet bands of coordination complexes 2 (1968) 22
Mason, S.F., see Harding 7 (1970) 70
Masuda, K., see Kawabe 8 (1971) 448
Masuhara, H. and N. Mataga, Fluorescence spectra and excited singlet–singlet absorption spectra of *s*-tetracyanobenzene EDA complexes by laser excitation 6 (1970) 608

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Mataga, N., Y. Torihashi and Y.Ota, Studies on the fluorescence decay times of anthracene and perylene excimers in rigid matrices at low temperatures in relation to the structures of excimers 1 (1967) 385
Mataga, N., see Masuhara 6 (1970) 608
Mataga, N., see Masuhara 7 (1970) 417
Mataga, N., see Egawa 8 (1971) 108
Matheson, I.B.C. and J. Lee, Reaction of chemical acceptors with singlet oxygen produced by direct laser excitation 7 (1970) 475
Matheson, I.B.C. and J. Lee, Comparison of the pressure dependencies of the visible and infrared electron absorption spectra of oxygen in gas and in freon solution 8 (1971) 173
Matheu, F.M., see Ellison 10 (1971) 322
Mathur, B.P., see Saxena 1 (1967) 224
Mathur, H.B. and M.P. Gupta, A Mössbauer spectroscopic study of the nature of the bonding in bis-dithioacetylacetone tetrachloro-ferrate (II) 3 (1969) 191
Mathur, S.C. and D.C. Singh, On molecular orbitals for band structure calculations 5 (1970) 249
Matsushita, T., see Terasaka 4 (1969) 384
Matyash, I.V., see Zhogolev 10 (1971) 444
Maurer, A.H., see Maricle 2 (1968) 602
Maus, J.A., see Levine 10 (1971) 2
Maxdorf, M., see Nickel 9 (1971) 555
Mayer, I., Comments on the EPR spectra of irradiated solid glycine 8 (1971) 117
Mayer, J., see Kroh 1 (1967) 191
Mayfarth, H., see Degenkolb 8 (1971) 288
Mays, M.J., see Bancroft 4 (1969) 248
Mazur, Y., see Yogev 8 (1971) 157
Mazziotti, A., The effect of correlation on the nuclear magnetic shielding constants in atomic systems 5 (1970) 343
McAloon, K.T., see Beagly 10 (1971) 78
McCall, M.T., see Pedersen 3 (1969) 569
McCourt, F.R., see Moraal 3 (1969) 691
McCourt, F.R., see Coope 4 (1969) 84
McCourt, F.R., see Hess 5 (1970) 53
McCourt, F.R. and H. Moraal, On the Senftleben–Beenakker effects in time-varying fields 7 (1970) 123
McCourt, F.R. and H. Moraal, On the thermomagnetic torque for nitrogen 9 (1971) 35
McCourt, F.R. and H. Moraal, On the definition of collision cross sections for polyatomic gases 9 (1971) 39
McCubbin, W.L. and R. Manne, Simple LCAO band calculation for the ideal polyethylene chain 2 (1968) 230
McCubbin, W.L., An assessment of polymer band structure calculations 8 (1971) 507
McCullough, D.W. and W.D. McGrath, The collisional deactivation of $O(^1D)$ atoms by molecular oxygen 8 (1971) 353
McDonald, I.R., Monte Carlo calculations for one- and two-component fluids in the isothermal–isobaric ensemble 3 (1969) 241
McDowell, C.A., see Frost 1 (1967) 93

McDowell, C.A., see Charles 1 (1967) 451
McDowell, C.A., see Fyfe 2 (1968) 170
McDowell, C.A., see Frost 2 (1968) 663
McDowell, C.A., see Lin 3 (1969) 244
McDowell, C.A., see Branton 3 (1969) 581
McDowell, C.A., see Dalal 4 (1969) 97
McDowell, C.A., see Frost 4 (1970) 533
McDowell, C.A., see Branton 5 (1970) 1
McDowell, C.A., see Frost 5 (1970) 291
McDowell, C.A., see Cornford 5 (1970) 486
McDowell, C.A., see Dalal 6 (1970) 617
McDowell, C.A., see Cornford 10 (1971) 345
McEachran, R.P., see Cohen 9 (1971) 498
McEachran, R.P., see Jackson 10 (1971) 143
McEwan, M.J., see Freeman 5 (1970) 555
McEwan, M.J., see Freeman 6 (1970) 482
McEwan, M.J., see Freeman 8 (1971) 77, 226
McEwan, M.J., see Freeman 9 (1971) 578
McEwan, M.J., see Freeman 10 (1971) 530
McFarlane, W., A. Noble and J. Winfield, A reversal of the sign of the ^{183}W–^{19}F spin–spin coupling constant in octahedral tungsten(VI) derivatives 6 (1970) 547
McGlynn, S.P., see Rabalais 3 (1969) 59
McGlynn, S.P., see Johnson 7 (1970) 618
McGlynn, S.P., see Johnson 10 (1971) 595
McGowan, J.W., see Vroom 3 (1969) 476
McGowan, J.W., J.F. Williams and D.A. Vroom, Lyman-α radiation from electron collisions with simple hydrogen containing molecules 3 (1969) 614
McGrath, W.D., see McCullough 8 (1971) 353
McGurk, J.C., see Callear 6 (1970) 417
McGurk, J., see Callear 7 (1970) 491
McIntyre, N.S., see Vander Auwera-Mahieu 4 (1969) 198
McIntyre, H.M., T.B. Cobb and C.S. Johnson, Intermediate resolution NMR spectra of solids by means of magnetic dilution 4 (1970) 585
McIver Jr., J.W., see Pople 1 (1967) 465
McIver Jr., J.W., see Beveridge 4 (1969) 126
McIver Jr., J.W. and A. Konornicki, Rapid geometry optimization for semi-empirical molecular orbital methods 10 (1971) 303
McKenney, D.J., see Provencher 5 (1970) 26
McKenney, D.J., see Provencher 10 (1971) 365
McKenzie, A. and B.A. Thrush, The mechanism of the air afterglow 1 (1968) 681
McKoy, V., see Winter 6 (1970) 175
McLauchlan, K.A., see Atkins 8 (1971) 55
McLean, R.A.N., see Frost 10 (1971) 347
McNicol, B.D., see Pott 6 (1970) 623
McQuarrie, D.A., see Futrelle 2 (1968) 223
McWeeny, R., Self-consistent perturbation theory 1 (1968) 567
McWeeny, R., see Cook 1 (1968) 588
McWeeny, R., Gauge invariance and the magnetic properties of molecules 9 (1971) 341

McWeeny, R., see Edwards 10 (1971) 283
McWilliams, D., see Claxton 4 (1970) 505
Mecklenbrauck, W., see Kempter 6 (1970) 97
Medvedev, E.S., see Osherov 8 (1971) 550
Meisels, G.G., see Leger 1 (1968) 661
Melliar-Smith, C.M., see Jonathan 7 (1970) 257
Melveger, A.J., see Brasch 2 (1968) 99
Melveger, A.J., see Rush 2 (1968) 621
Melveger, A.J., see Rush 6 (1970) 533
Meneghetti, L., see Cavallini 7 (1970) 303
Mentzafos, D., see Trommsdorff 10 (1971) 569
Menzinger, M., see Kempter 6 (1970) 97
Menzinger, M., Non-statistical H-atom recombination: a gross atomic kinetic effect with "spectroscopic sensitivity" 10 (1971) 507
Meriaudeau, P., M. Che and C.K. Jørgensen, Angular overlap treatment and electron spin resonance of titanium(III) in anatase 5 (1970) 131
Merrifield, R.E., P. Avakian and R.P. Groff, Fission of singlet excitons into pairs of triplet excitons in tetracene crystals 3 (1969) 155
Erratum 3 (1969) 728
Merrifield, R.E., see Groff 5 (1970) 168
Merritt, F.R., see Wickman 1 (1967) 117
Messner, R.P., see Choi 5 (1970) 503
Meyer, H., see Inacker 7 (1970) 213
Meyer, H. and A. Schweig, An application of the CNDO/2 and INDO theories to the calculations of molecular quadrupole moments 9 (1971) 451
Meyer, Y.H., see Astier 3 (1969) 399
Meyer, Y.H., R. Astier and J.M. Leclercq, Triplet–triplet absorption of biphenyl 4 (1970) 587
Micha, D.A., Compound state resonances in molecular collisions: the integral elastic cross section for D_2–Xe scattering 1 (1967) 139
Micha, D.A. and M. Rotenberg, Impact parameter dependence of vibrational excitation cross sections for H_2 + He collisions 6 (1970) 79
Micha, D.A., S.Y. Tang and E.E. Muschlitz Jr., Semi-empirical model for Penning and associative ionization: velocity dependence and branching ratios for Ne($^3P_{2,0}$) collisions with Ar, Kr, and Xe 8 (1971) 587
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Michaelson, R.C. and A.L. Smith, Time resolved studies of rare-gas molecular emission in the vacuum ultraviolet: helium and argon 6 (1970) 1
Michel-Beyerle, M.E. and F. Willig, The interaction of triplet excitons at the anthracene crystal surface with redox couples and with dye molecules in aqueous solution 5 (1970) 281
Michel-Beyerle, M.E., see Handel 5 (1970) 377
Michels, H.H. and F.E. Harris, Predissociation effects in the $A^2\Sigma^+$ state of the OH radical 3 (1969) 441
Mielczarek, S.R. and K.J. Miller, Dependence of generalized oscillator strengths of H_2O on momentum transfer 10 (1971) 369
Miescher, E., see Ackermann 2 (1968) 351
Migirdicyan, E., see Leach 1 (1967) 21
Millen, D.J., see Chadwick 5 (1970) 407
Miller, D.J. and L.C. Cusachs, Semi-empirical molecular orbital calculations on the bonding in sulphur compounds. I. Elemental sulphur, S_6 and S_8 3 (1969) 501

Miller, D.P., see Ditchfield 6 (1970) 573
Miller, K., see Kirby 3 (1969) 643
Miller, K.J., see Mielczarek 10 (1971) 369
Miller, M.M., see Fong 10 (1971) 408
Miller, W.H., Computation of autoionization lifetimes via a 'golden rule'-like formula 4 (1970) 627
Miller, W.H., The classical *S*-matrix: a more detailed study of classically forbidden transitions in inelastic collisions 7 (1970) 431
Miller, W.H., Molecular Ramsauer–Townsend effect in very low energy ^4He–^4He scattering 10 (1971) 7
Mills, I.M., Redundant coordinates in harmonic force-field calculations 3 (1969) 267
Mills, J.W. and R.N. Zare, Magnetic depolarization of CS_2 vapor fluorescence 5 (1970) 37
Milov, A.D., K.M. Salikhov and Yu.D. Tsvetkov, Electron spin echo studies of magnetic relaxation in liquids: solutions of 2, 4, 6 tri-*t*-butylphenoxyl 8 (1971) 523
Minton, A.P., Note on the dielectric properties of water 7 (1970) 606
Mintz, K.J. and D.J. Le Roy, A novel method for the determination of quenching cross sections of Na(^2P) atoms 10 (1971) 280
Miron, E., B. Raz and J. Jortner, A comment on the V excited state of the ethylene molecule 6 (1970) 563
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Mirri, A.M. and W. Caminati, Quadrupole hyperfine structure in the rotational spectrum of iodobenzene 8 (1971) 409
Mirri, A.M., see Damiani 10 (1971) 351
Mispelter, J., Electron spin resonance of phosphorescent biphenyl 10 (1971) 539
Mitchel, K.A.R. and T. Thirunamachandran, Valence-bond calculations on the ground state of BeH_2 6 (1970) 407
Mitchell, P. and M. Wilson, A note on the ionization potentials of mercury 3 (1969) 389
Mitra, S., see Martin 3 (1969) 183
Mitra, S., see Gregson 3 (1969) 392, 528
Mitra, S., see Gregson 5 (1970) 310
Miyake, C., T. Yoshimura and S. Imoto, Paramagnetic resonance of uranium (IV)-cupferrate 4 (1969) 275
Mizuno, A., see Morishima 7 (1970) 633
Möbius, D., see Vaubel 10 (1971) 334
Möbius, K., see Biehl 10 (1971) 605
Moccia, R., see Arrighini 1 (1967) 242
Moccia, R., Variable bases in SCF MO calculations 5 (1970) 260
Moccia, R., Upper bounds for the calculation of second order HF energies 5 (1970) 265
Moccia, R., see Arrighini 7 (1970) 351
Moccia, R., see Gianturco 10 (1971) 269
Moddeman, W.E., see Carlson 5 (1970) 390
Modrak, P., Self-consistent-field method including correlation effect for two-electron atomic systems 1 (1967) 61
Moffat, J.B. and H.E. Popkie, A correlation between dissociation energy and sharing interference energy 5 (1970) 331
Mogensen, O., see Eldrup 10 (1971) 379
Mohanty, S. and H.J. Bernstein, Temperature and pressure dependence of the chemical shift of gases 4 (1970) 575
Möhwald, H., see Beens 8 (1971) 341
Moisan-Pellois, A., R. Collorec and J. Ripoche, Fluorescence spectrum of the photo-dissociated *m*-ethyltoluene trapped in methylcyclohexane at very low temperature 5 (1970) 299

Molin, Yu.N., see Sagdeev 5 (1970) 471
Molin, Yu.N., On the "anomalous" spin density distribution in some conjugated ligands of paramagnetic complexes 5 (1970) 511
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Momigny, J., see Wankenne 4 (1969) 132
Momigny, J., see Locht 6 (1970) 273
Monkhorst, H.J., Geometrical changes during the internal rotation in ethane 3 (1969) 289
Monkhorst, H.J. and F.E. Harris, Multicenter integrals via Gaussian expansion of Slater-orbital products 3 (1969) 537
Monkhorst, H.J., Comments on "geometrical changes during the internal rotation in ethane" 4 (1969) 119
Monkhorst, H.J., see Harris 4 (1969) 181
Montenay-Garestier, Th., see Hélène 2 (1968) 25
Moody, G.R., see Amos 3 (1969) 411
Mookherji, T. and A.P. Kulshreshta, Semi-conductivity in β-alanine 6 (1970) 423
Mookherji, T., see Özer 10 (1971) 204
Moore, C.B., see Fink 4 (1969) 283
Moore, L., see Boness 1 (1967) 292
Mooy, J.H.M., see Zijlstra 7 (1970) 553
Moraal, H. and F.R. McCourt, The Senftleben effects for a gas of $^2\Sigma$ molecules. II. A comparison between theory and experiment 3 (1969) 691
Moraal, H., see Coope 4 (1969) 84
Moraal, H., see McCourt 7 (1970) 123
Moraal, H., The Senftleben effects for a gas of $^2\Sigma$ molecules. III. Determination of spin–rotation coupling constants 7 (1970) 205
Moraal, H., see McCourt 9 (1971) 35, 39
Moraal, H. and R.F. Snider, Kinetic theory collision integrals for diatomic molecules 9 (1971) 401
Moran, T.F. and D.C. Fullerton, Non-vertical transitions in the collision induced dissociation of 0.7 to 2 keV H_2^+ ions 2 (1968) 625
Moran, T.F., see Petty 5 (1970) 64
Moran, T.F., F. Petty and G.S. Turner, Pure rotational excitation in Co^+–Ar interactions by ion beam collision spectroscopy 9 (1971) 379
Moran, T.F., see Fullerton 10 (1971) 626
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Moreira Xavier, R., see Gomes 4 (1969) 239
Morgenstern, R., A. Niehaus and M.W. Ruf, Angular distributions of photoelectrons 4 (1970) 635
Morgner, H., see Hotop 10 (1971) 493
Mori, Y., see Jano 2 (1968) 185
Morigaki, K., see Hayashi 9 (1971) 119
Morishima, I., see Nakatsuji 4 (1970) 607
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Morishima, I., K. Endo and T. Yonezawa, Studies on the NMR contact shifts induced by hydrogen bonding with nitroxide radical. A correlation between ^{13}C contact shifts induced by ^{13}C–H. . . nitroxide hydrogen bond and ^{13}C–H nuclear spin coupling constants 9 (1971) 203
Morokuma, K., Symmetric versus asymmetric hydrogen bonds in polymeric water 4 (1969) 358
Morokuma, K., The electronic structures of infinite linear polymers 6 (1970) 186
Morokuma, K., Electronic structures of linear polymers. CNDO/2 calculation for polyglycine 9 (1971) 129
Morosi, G., see Gamba 3 (1969) 20
Morosi, G. and M. Simonetta, A theoretical study of the conformation of crystalline polyethylene 8 (1971) 358
Morris, A., see Jonathan 7 (1970) 497
Morris, G.C., see Angus 5 (1970) 480
Moser, C.M., see Verhaegen 9 (1971) 479
Mosesman, M., see Fehsenfeld 4 (1969) 73
Moskowitz, J.W., see Hollister 3 (1969) 185, 728
Moskowitz, J.W., see Basch 4 (1969) 79
Moskowitz, J.W., see Hankins 4 (1970) 527
Moskowitz, J.W., see Schulman 8 (1971) 361
Moustafa Moussa, H.R., see de Heer 1 (1967) 484
Moutinho, A.M.C., see Baede 3 (1969) 530
Mourits, F.M., see Glasbeek 8 (1971) 372
Muckerman, J.T., see Levine 1 (1968) 517
Muckerman, J.T., see Levine 2 (1968) 545
Muckerman, J.T. and R.B. Bernstein, Predicted spectrum of subthreshold rotational compound state resonances: p-H_2–Xe and o-D_2–Xe 4 (1969) 183
Muel, B., see Ewald 5 (1970) 83
Mueller, C.R., see Searcy 8 (1971) 123
Mueller, K.A., see Simanek 4 (1970) 482
Mulcahy, M.F.R. and D.J. Williams, Chemiluminescent emission from the $O(^3P)$–SO_2 system 7 (1970) 455
Mulder, J.J.C. and J.S. Wright, The electronic structure and stability of CH_5^+ and CH_5^- 5 (1970) 445
Mullen, P., K. Schwochau and C.K. Jørgensen, Vacuo ultraviolet spectra of permanganate, pertechnetate and perrhenate 3 (1969) 49
Müller, A. and E. Pflüger, Laser-flash-spectroscopy of cryptocyanine 2 (1968) 155
Müller, A., E. Diemann and A.C. Ranade, The electronic spectra of VO_4^{3-}, VS_4^{3-} and VSe_4^{3-} 3 (1969) 467
Müller, A., see Kebabcioglu 8 (1971) 59
Müller, A. and E. Diemann, Higher energy bands in the electronic absorption spectra of CrO_4^{2-}, RuO_4, OsO_4, WS_4^{2-}, MoS_4^{2-}, WSe_4^{2-} and $MoSe_4^{2-}$. A note on the assignment of the electronic spectra of closed shell tetroxo-, tetrathio- and tetraselenoanions 9 (1971) 369
Müller, G., see Bennewitz 9 (1971) 19
Mulliken, R.S., The role of kinetic energy in the Franck–Condon principle; with applications to the iodine molecule emission spectrum 7 (1970) 11
Munn, R.W. and W. Siebrand, Phonon-limited transport of charge carriers in molecular crystals 3 (1969) 655
Murad, E. and W.B. Maier II, Production of N_2^+ in collisions between N^+ and N_2 7 (1970) 624
Murov, S.L., see Yang 3 (1969) 6
Murov, S.L., see Yang 5 (1970) 60
Murphy, W.F., see Holzer 4 (1970) 641
Murphy, W.F., see Perchard 8 (1971) 559
Murrell, J.N., see Harada 1 (1968) 595

Murthy, A.S.N. and C.N.R. Rao, Molecular orbital treatment of hydrogen bonding by the EHT and the CNDO/2 methods: water 2 (1968) 123
Murty, C.R.K., see Kameswara Rao 1 (1967) 323
Muschlitz Jr., E.E., see Micha 8 (1971) 587
Musher, J.I., see Amos 1 (1967) 149
Musher, J.I., see Amos 3 (1969) 721
Musher, J.I., see Amos 4 (1969) 93
Musher, J.I., On the *Z*-expansion of atomic properties 6 (1970) 33
Musher, J.I., On the Hartree–Fock problem 7 (1970) 397
Mu Shik Jhon, see Dong Sik Choi 5 (1970) 57
Musso, G.F., see Magnasco 9 (1971) 433
Mustafa, M.R., see Frost 2 (1968) 663
Muto, Y., Y. Nakato and H. Tsubomura, Solvent effects on the fluorescence spectra of some aliphatic amines in solutions 9 (1971) 597
Myers, C.E., see Smoes 8 (1971) 10
Myers, G.H., see O'Brien Jr. 9 (1971) 544

Naccache, C., see Che 8 (1971) 45
Naccache, C., see Williamson 9 (1971) 33
Naegeli, D.W. and C.J. Ultee, A cw HCl chemical laser 6 (1970) 121
Nagakura, S., see Hayashi 9 (1971) 119
Nagakura, S., see Yoshihara 9 (1971) 469
Nageswara Rao, B.D., see Kitchlew 2 (1968) 216
Nageswara Rao, B.D., see Mahajan 10 (1971) 29
Nagibarov, V.R. and V.V. Samartsev, Overlapping peak trains of giant laser pulses and photon echo generation 5 (1970) 61
Nagy, G., see Cameron 8 (1971) 628
Nain, V.P.S. and S.C. Saxena, On the appropriateness of Dymond, Rigby and Smith intermolecular potential 1 (1967) 46
Nain, V.P.S. and M.P. Saksena, The modified-BCK potential for non-polar molecules 1 (1967) 125
Nain, V.P.S., see Saksena 1 (1967) 424
Nakajima, T. and A. Toyota, The groundstate geometries and symmetries of some non-alternant conjugated hydrocarbons 3 (1969) 272
Nakajima, T., see Toyota 6 (1970) 144
Nakamura, K. and N. Hirota, EPR and optical studies on the nature of ionic species in solutions of radical ions 3 (1969) 134
Nakamura, K. and N. Hirota, EPR studies of solvation and structures of ion pairs 3 (1969) 137
Nakashima, N., see Egawa 8 (1971) 108
Nakato, Y., N. Yamamoto and H. Tsubomura, Absorption spectrum of pyrene in the excited singlet state measured by the flash method 2 (1968) 57
Nakato, Y., see Muto 9 (1971) 597
Nakato, Y., M. Ozaki, A. Egawa and H. Tsubomura, Organic amino compounds with very low ionization potentials 9 (1971) 615
Nakatsuji, H., see Yonezawa 2 (1968) 454
Nakatsuji, H., H. Kato, L. Morishima and T. Yonezawa, Anisotropy of the indirect nuclear spin–spin coupling constant 4 (1970) 607
Nakatsuji, H., K. Hirao, J. Kato and T. Yonezawa, Anisotropy of the indirect nuclear spin–spin coupling constant. II. Treatment by the finite perturbation method 6 (1970) 541

Nalley, S.J. and R.N. Compton, Collisional ionization of cesium by oxygen: the electron affinity of O_2 9 (1971) 529
Namba, S., see Kawabe 8 (1971) 448
Naqvi, K.R., P-type delayed fluorescence from rigid solutions 1 (1967) 497
Naqvi, K.R., The mechanism of p-type delayed fluorescence from fluid solutions 1 (1968) 561
Naqvi, K.R., see Hamilton 2 (1968) 374
Naqvi, K.R., see Leite 4 (1969, 1970) 35, 590
Naqvi, K.R., Reaction kinetics of phosphorescence and delayed fluorescence: calculation of the phosphorimeter factor and quantum efficiencies 5 (1970) 171
Naqvi, K.R., On the delayed fluorescence of pyrene in viscous solutions 5 (1970) 288
Naqvi, K.R. and C. Steel, Exchange-induced resonance energy transfer 6 (1970) 29
Naqvi, K.R., Comments on: "Calculation of phosphorimeter factor – reply to a criticism" 6 (1970) 518
Narasimhan, P.T., see Gupta 1 (1967) 377
Narasimhan, P.T., see Ray 2 (1968) 59
Narasimhan, P.T., see Ray 2 (1968) 101
Narasimhan, P.T., see Gupta 2 (1968) 150
Narayana, P.A., K.V.L.N. Sastry and T.M. Srinivasan, EPR of Mn^{2+}: NaF 5 (1970) 278
Narbutowicz, M.A., see Stecki 5 (1970) 345
Nasielski, J., see Vander Donckt 2 (1968) 409
Natalis, P. and J.E. Collin, The first ionization potential of nitrogen dioxide 2 (1968) 79
Natalis, P., see Collin 2 (1968) 194
Natalis, P. and J.E. Collin, Experimental evidence for high vibrational excitation in O_2^+ ground state by photoelectron spectroscopy 2 (1968) 414
Natalis, P., see Delwiche 5 (1970) 564
Natalis, P., J. Delwiche and J.E. Collin, The first ionization energy of NO_2. What answer can be brought at present by photoelectron spectroscopy? 9 (1971) 139
Nath, A., M. Harpold, M.P. Klein and W. Kündig, Emission Mössbauer spectroscopy for biologically important molecules. Vitamin B_{12}, its analogs, and cobalt phthalocyanine 2 (1968) 471
Nava, A., see Majorino 7 (1970) 420
Nava, A., see Majorino 9 (1971) 88
Navangul, H., see Seibold 3 (1969) 275
Navon, G., Proton relaxation times and hydration numbers of manganese ions bound to enzymes 7 (1970) 390
Nazaroff, G.V., A unified model for resonances in scattering cross sections 6 (1970) 138
Neal, S.B., see Campbell 8 (1971) 612
Nelson, D.R., see Davis 3 (1969) 461
Nelson, D.R., see Davis 6 (1970) 277
Nelson, L.Y., see Flournoy 6 (1970) 521
Németh, G., see Jancsó 7 (1970) 314
Nesbet, R.K., T.L. Barr and E.R. Davidson, Correlation energy of the neon atom 4 (1969) 203
Newman, D.J., see Bradbury 1 (1967) 44
Newman, D.J., see Bradbury 2 (1968) 495
Newman, D.J. and M.M. Curtis, On the accuracy of Hartree–Fock wavefunctions 3 (1969) 158
Newman, D.J., Origin of the ground state splitting of Gd^{3+} in crystals 6 (1970) 288
Newman, D.J., see Curtis 9 (1971) 606
Newman, J.D. and S.S. Bishton, Theory of the correlation crystal field 1 (1968) 616
Newman, J.D., Linked cluster theorem for non-orthogonal wavefunctions 1 (1968) 684
Ng, E.W., see Fink 4 (1969) 347

Ng, E.W., see Bonham 4 (1969) 355
Ng, E.W., see Bonham 6 (1970) 403
Ng, E.W., see Bonham 7 (1970) 395
Nguyen Van Nghia, M.R. Pearlman and R.H. Webb, Recent results in dynamic polarization studies of liquids 2 (1968) 176
Nicholls, R.W., see Drake 3 (1969) 457
Nickel, B., H. Staerk and A. Weller, Energy transfer from adsorbed dye molecules to anthracene single crystals 4 (1969) 27
Nickel, B. and M. Maxdorf, A new method for the determination of the diffusion coefficient of triplet excitons in the c'- direction of crystalline anthracene 9 (1971) 555
Nicol, M., see Ebisuzaki 3 (1969) 480
Niehaus, A., see Hotop 3 (1969) 687
Niehaus, A., see Morgenstern 4 (1970) 635
Niehaus, A., see Hotop 8 (1971) 497
Niehaus, A., see Hotop 10 (1971) 493
Nielsen, O.F., see Cyvin 5 (1970) 597
Nielsen, S.E. and R.S. Berry, Vibronic autoionization and predissociation in hydrogen 2 (1968) 503
Nielsen, U., see Haensel 9 (1971) 548
Nieuwpoort, W.C., see Wiersma 2 (1968) 637
Nieuwpoort, W.C., see Kracht 9 (1971) 48
Nigam, A.N. and K.B. Garg, The quadrupole transition $L_{\mathrm{I}}M_{\mathrm{V}}$ (β_9) in ^{65}terbium 2 (1968) 121
Nigam, A.N. and K.B. Garg, The s-line in the L-spectrum of ^{66}Dy 3 (1969) 398
Nigam, A.N. and Q.S. Kapoor, The quadrupole transition $L_{\mathrm{II}}N_{\mathrm{III}}$ in erbium-68 4 (2969) 455
Nigam, A.N. and Q.S. Kapoor, The 's' line in the L spectrum of ^{64}Gd 4 (1970) 639
Niizuma, S., H. Kokubun and M. Koizumi, Four radical species produced upon excitation of the molecular complex of acridine and acridan in the solid state 7 (1970) 279
Nijboer, B.R.A., see Renne 1 (1967) 317
Nijboer, B.R.A. and M.J. Renne, Microscopic derivation of macroscopic Van der Waals forces. II. 2 (1968) 35
Nijboer, B.R.A., see Renne 6 (1970) 601
Nijboer, B.R.A., see Renne 7 (1970) 396
Niki, H., see Stuhl 4 (1969) 417
Niki, H., see Stuhl 5 (1970) 573
Niki, H., see Stedman 7 (1970) 173
Niki, H., see Stuhl 7 (1970) 197, 473
Nikitin, E.E., see Bjerre 1 (1967) 179
Nikitin, E.E., Optical model for spectator-stripping reactions 1 (1967) 266
Nikitin, E.E., Non-resonance excitation transfer in atomic collisions induced by dipole–dipole interaction 2 (1968) 402
Nikitin, E.E., see Kapralova 2 (1968) 581
Nikitin, E.E. and A.I. Reznikov, Excitation transfer in collisions of highly excited alkali atoms. I. Cesium–noble gases collisions 8 (1971) 161
Nikitin, E.E., see Zembekov 9 (1971) 213
Nikulin, V.K., see Gaydaenko 7 (1970) 360
Niles, F.E., see Keller 10 (1971) 526
Nitzan, A., J. Jortner and P.M. Rentzepis, Peculiarities of the non radiative decay of a single vibronic level in polyatomic molecules 8 (1971) 445
Nitzan, A., J. Jortner, J. Kommandeur and E. Drent, A quantum mechanical analogue of the Stern–Volmer equation 9 (1971) 273

Niver, R.E., see Gregg 8 (1971) 609
Noble, A., see McFarlane 6 (1970) 547
Noda, S., K. Fueki and Z. Kuri, Trapped electrons in alkylamine glasses at 77°K 8 (1971) 407
Noe, L.J., see Hochstrasser 5 (1970) 489
Nørby Svendsen, E., see Hansen 5 (1970) 483
Nordin, S. and R.L. Strong, On the conditions necessary for diffusion-controlled energy transfer between triplet states 2 (1968) 429
Nordio, P.L., M. Rossi and G. Giacometti, Vibronic coupling and singlet–triplet splitting in aromatic dinegative ions 1 (1967) 101
Nordio, P.L., Lineshape effects of anisotropic diffusion 6 (1970) 250
Nordling, C., see Hamrin 1 (1968) 557, 613
Norman, B.J., see Mason 2 (1968) 22
Norris, C.L., R.C. Benson and W.H. Flygare, The microwave spectrum of cyclopent-3-en-1-one and the molecular Zeeman effect of cyclopent-3-en-1-one and cyclopent-2-en-1-one 10 (1971) 75
Norris, J.R., Rapid computation of magnetic resonance line shapes for exchange among many sites 1 (1967) 333
Norstrom, R.J., see Van den Berg 4 (1969) 101
Novak, A., see Lindgren 3 (1969) 84
Novakov, T., see Prins 9 (1971) 593
Novaro, O.A., see Bader 8 (1971) 568
Nowakowski, J., Simple LCAO MO calculations of the spin densities for radical ions of conjugated hydrocarbons with modified McLachlan's method 2 (1968) 289
Nozik, A.J. and M. Kaplan, Kinetics of the cubic-to-hexagonal phase transformation in ice doped with Mössbauer ions 1 (1967) 391
Nugent. L.J., R.D. Baybarz, G.K. Werner and H.A. Friedman, Intramolecular energy transfer and sensitized luminescence in an einsteinium β-diketone chelate and the lower lying electronic energy levels of Es(III) 7 (1970) 179
Nyeland, C. and A. Hunding, Perturbed stationary states treatment of vibrational excitation in collinear collisions 5 (1970) 143

Oakes, J., see Claxton 1 (1967) 189
Obada, A.-S.F., see Bullough 2 (1968) 293
Obada, A.-S.F., see Bullough 3 (1969) 114, 177
Obashi, H., see Mataga 1 (1967) 133
O'Brien, E.F. and G.W. Robinson, Computer simulation of the system N_2 in fluid argon Correlation functions and relaxation times 8 (1971) 79
O'Brien Jr., R.J. and G.H. Myers, Oxygen-NO_2 energy transfer 9 (1971) 544
Oddershede, J. and J. Linderberg, First order calculations of spin densities in ClO_4^{2-} and ClO_4 8 (1971) 165
Oden, L.E. and D. Henderson, Simple calculation of the pair distribution function for a moderately dense hard-sphere fluid 8 (1971) 85
O'Dwyer, M.F., see Brown 1 (1967) 459
O'Dwyer, M.F., see Kent 10 (1971) 201
Offen, H.W., see Simpson 2 (1968) 383
Offen, H.W., see Johnson 6 (1970) 505
Ogdan, J., see Czapski 3 (1969) 383
O'Grady, W.E. and J.O'M. Bockris, Observing thin films of iron oxides with Mössbauer spectroscopy 5 (1970) 116
Ogryzlo, E.A., see Gray 3 (1969) 658

Öhrn, Y., see Linderberg 1 (1967) 295
Öhrn, Y., see Linderberg 3 (1969) 119
Öhrn, Y., see Abdulnur 6 (1970) 502
Öhrn, Y., see Thulstrup 9 (1971) 485
Oja, T., see Marino 4 (1970) 489
Okada, T., see Mataga 1 (1967) 119, 133
O'Konski, C.T., see Tae-Kyu Ha 3 (1969) 603
Oksengorn, B., Relativistic interpretation of stimulated Raman scattering 1 (1968) 591
Okutani, J., see Kihara 8 (1971) 63
Oleari, L., see Day 5 (1970) 533
Olbregts, J., see Bertrand 5 (1970) 183
Olsen, L.A.R., see Brion 3 (1969) 600
Olympia Jr., P.L., The natural states of neon 5 (1970) 558
Olympia Jr., P.L., Some theoretical aspects of C – H. . . O bonding 5 (1970) 593
Olympia Jr., P.L. and B.M. Fung, Oxygen electric field gradient in OH_3^+ 6 (1970) 87
O'Neil, S.V., see Heil 5 (1970) 253
O'Neil, S.V., P.K. Pearson and H.F. Schaeffer III, Repulsive $^3\Sigma^-$ and low-lying ($\geqslant$ 1.9 eV) $^3\Sigma^+$ states of BeO 10 (1971) 404
Ong, P.P., see Böhme 1 (1967) 259
Oosterhoff, L.J., see Emeis 1 (1967) 129
Oosterhoff, L.J., see Brongersma 1 (1967) 169
Oosterhoff, L.J., see Knoop 3 (1969) 73
Oosterhoff, L.J., see Brongersma 3 (1969) 437
Oosterhoff, L.J., see Kaptein 4 (1969) 195, 214
Oosterhoff, L.J., see Varma 8 (1971) 1
Oosterhoff, L.J., see Varma 9 (1971) 406
Orban, J. and A. Bellemans, Phase transitions in triangular lattice gases with hard cores 1 (1967) 205
Orban, J., see Bellemans 1 (1968) 639
Orban, J., see Bellemans 2 (1968) 253
Orban, J., Phase transition in three-dimensional lattice gas of hard-core molecules 3 (1969) 702
Orchard, A.F., see Evans 4 (1969) 361
Orchard, A.F., see Cox 7 (1970) 273, 414
O'Reilly, D.E., E.M. Peterson, Z.M.El Saffar and C.E. Scheie, Anisotropy of the chemical shift tensor in solid fluorine 8 (1971) 470
O'Reilly, D.E., Exchange narrowing in electron paramagnetic resonance of ruby 10 (1971) 239
Orlandi, G. and W. Siebrand, Vibronic coupling and line broadening in polyatomic molecules 8 (1971) 473
Orloff, M.K., see Brinen 1 (1967) 276
Ortega, S., L.D. Kandel, M.C. Passeggi and T. Buch, Vibrational structure of EPR-spectra? 3 (1969) 35
Orville-Thomas, W.J., J.A. Ladd and W. Lüttke, The effect of torsional vibrations on molecular structure 6 (1970) 629
Osborne, D.T., see Michael 3 (1969) 402
Osborne, G.A., see LoMenzo 9 (1971) 332
Osherov, V.I., On resonant non-adiabatic transitions 1 (1967) 182
Osherov, V.I., Non-adiabatic transitions between bound states 1 (1968) 539
Osherov, V.I. and E.S. Medvedev, Light absorption during vibrational relaxation 8 (1971) 550
Osredkar, R., see Blinc 9 (1971) 85
Oster, G.K., see Levin 9 (1971) 210

Ostlund, N.S., see Pople 1 (1967) 465
O'Sullivan, P.S. and H.F. Hameka, On the structure of cyclopentadiene 4 (1969) 123
O'Sullivan, P.S., J. de la Vega and H.F. Hameka, Calculations of bond angles in five-membered conjugated ring systems 5 (1970) 576
Ota, Y., see Mataga 1 (1967) 385
Ottinger, Ch. and R.N. Zare, Crossed beam chemiluminescence 5 (1970) 243
Ottinger, Ch. and D. Poppe, Collision-induced rotational and vibrational quantum jumps in electronically excited Li_2 8 (1971) 513
Otto, A., see Koch 6 (1970) 15
Ottolenghi, M., see Czapski 3 (1969) 383
Ottolenghi, M., see Goldschmidt 4 (1970) 570
Ottolenghi, M., see Tamir 6 (1970) 369
Ottolenghi, M., see Potashnik 6 (1970) 525
Ottolenghi, M., see Potashnik 9 (1971) 424
Ouseph, P.J., see Dézsi 9 (1971) 390
Outhwaite, C.W., The linear extension of the Debye–Hückel theory of electrolyte solutions 5 (1970) 77
Outhwaite, C.W., A modified Poisson–Boltzmann equation in the double layer 7 (1970) 636
Outhwaite, C.W., see Burley 9 (1971) 109
Owen, N.L. and H.M. Seip, On the structure of gaseous methyl vinyl ether 5 (1970) 162
Owens, D.V., see El-Sayed 3 (1969) 339
Owens, D.V., see El-Sayed 6 (1970) 395
Ozaki, M., see Nakato 9 (1971) 615
Özer, A.M., A.P. Kulshreshtha and T. Mookherji, Electron paramagnetic resonance in polycrystalline β-alanine 10 (1971) 204

Pachomov, V.I., see Buslaev 3 (1969) 455
Pack, R.T, Van der Waals force constants from non-integer oscillator strength sums 5 (1970) 257
Pack, R.T, see Tsien 6 (1970) 54, 400
Pack, R.T, Relativistic long-range potentials from non-integer oscillator strength sums 6 (1970) 555
Erratum 8 (1971) 244
Pack, R.T, see Tsien 8 (1971) 579
Padley, P.J., see Bulewicz 9 (1971) 467
Pakula, B., see Grabowska 1 (1967) 369
Paladino, N., G. Lugli, U. Pedretti, M. Brunelli and G. Giacometti, Nuclear magnetic resonance pseudo-contact shifts in $U(allyl)_4$ 5 (1970) 15
Paldus, J. and J. Čížek, Stability conditions for the solutions of the Hartree–Fock equations for the simple open-shell case 3 (1969) 1
Palke, W.E., see Blint 5 (1970) 302
Palmer, R.W., see Dugan Jr. 6 (1970) 158
Palmieri, P., see Cook 3 (1969) 219, 223
Palmieri, P., see Bendazzolli 8 (1971) 556
Pan, Y.-L., see Gregg 8 (1971) 609
Pan, Y.-L., C.E. Turner Jr. and K.J. Pettipiece, The characteristics of an electron-beam-initiated pulsed chemical laser 10 (1971) 577
Pandey, S.D. and G.C. Upreti, Electron paramagnetic resonance of Mn^{2+}-doped NH_4NO_3. 3 (1969) 526
Pandey, S.D., EPR of off-center Eu^{2+} ions in RbCl 3 (1969) 646
Pant, D.D., C.L. Bhagchandani, K.C. Pant and S.P. Verma, Aggregation in xanthene dyes, exciton emission and phosphorescence enhancement 9 (1971) 546

Pant, K.G., see Pant 9 (1971) 546
Paraskevopoulos, G. and R.J. Cvetanović, Relative rate of reaction of $O(^1D_2)$ with H_2O 9 (1971) 603
Pardoe, G.W.F., see Chamberlain 1 (1968) 523
Pardoe, G.W.F., see Davies 2 (1968) 411
Parish, R.V. and C.E. Johnson, The origin of the quadrupole splitting in the Mössbauer spectra of some organotin halide complexes 6 (1970) 239
Parish, R.V., Anomalous sign of the quadrupole coupling constant for some *cis*-diorganotin(IV) complexes 10 (1971) 224
Parker, A.J., The determination of intensities of modulation-broadened lorentzian electron resonance lines 2 (1968) 74
Parker, B.R. and J. van Everv, Quantum tunnelling in DNA 8 (1971) 94
Parker, C.A., Calculation of phosphorimeter factor – reply to a criticism 6 (1970) 516
Parks, E.K. and S. Wexler, Collisional dissociative ionization of TlBr by accelerated Xe and Kr atoms 10 (1971) 245
Parmenter, C.S. and M.W. Schuyler, Single vibronic level fluorescence. III. Fluorescence yields from three vibronic levels in the $^1B_{2u}$ state of benzene 6 (1970) 339
Parmenter, C.S., see Ware 6 (1970) 342
Parmenter, C.S., see Anderson 8 (1971) 232
Parr, R.G., see Weare 1 (1967) 349
Parr, R.G., see Takahata 4 (1969) 109
Parr, R.G., see Anderson 10 (1971) 293
Parry Jones, G., M. Gregson and M. Davies, Total dielectric saturation observed in a dipolar solution 4 (1969) 33
Parry Jones, G., see Gregson 6 (1970) 215
Pasimeni, L., see Rossi 6 (1970) 468
Paskovich, D.H., see Reddoch 3 (1969) 351
Passchier, W.F., E.R. Klompmaker and M. Mandel, Absorption spectra of liquid and solid methanol from 1000 to 100 cm^{-1} 4 (1970) 485
Passchier, W.F., F.H. Jansen and M. Mandel, Absorption spectra of methanol in *n*-hexane from 700 to 50 cm^{-1} 7 (1970) 521
Passeggi, M.C., see Ortega 3 (1969) 35
Patscheke, E., H. Fuess and G. Will, Neutron diffraction study of $ErPO_4$ and $ErVO_4$ 2 (1968) 47
Pattengill, M., see Bunker 4 (1969) 315
Patterson, L.K., G. Porter and M.R. Topp, Oxygen quenching of singlet and triplet states 7 (1970) 612
Pauling, L., Octahedral hybrid orbitals 6 (1970) 249
Pauncz, R., see Landman 9 (1971) 489
Peachey, C.J., see Leech 1 (1968) 643
Peacock, R.D., Hypersensitivity of spectral bands on complexes of praesodymium(III) 7 (1970) 187
Peacock, R.D., A non-vibronic mechanism for the hypersensitive $^5D_2 \leftarrow {}^7F_0$ transition of europium(III) 10 (1971) 134
Pearlman, M.R., see Nguyen Van Nghia 2 (1968) 176
Pearson, P.K., see O'Neil 10 (1971) 404
Pearson, R.G., The structures of molecules in excited electronic states 10 (1971) 31
Pearson, R.K., see Gregg 8 (1971) 609
Peatman, W.B., T.B. Borne and E.W. Schlag, Photoionization resonance spectra. I. Nitric oxide and benzene 3 (1969) 492
Peatman, W.B., see Baer 4 (1969) 243
Pecul, K., The split hamiltonian matrix method and the interaction between two hydrogen atoms 9 (1971) 316

Pedersen; B., On the dipolar broadening of NMR fine-structure lines 1 (1967) 373
Pedersen, B. and K. Håland, Isotope effect in the ^{2}H-NMR-spectra of partly deuterated hydrates 2 (1968) 61
Pedersen, B., see Pyykkö 2 (1968) 297
Pedersen, L., D.G. Whitten and M.T. McCall, Excited states of N-heterocyclic molecules: nitrogen containing analogs of stilbene 3 (1969) 569
Pedersen, L., Possible contributing structures of polywater 4 (1969) 280
Pedersen, L. and R.G. Griffin, On the structure of the Li-naphthalenide anion 5 (1970) 373
Pedretti, U., see Paladino 5 (1970) 15
Pedulli, G.F., see Luckhurst 7 (1970) 49
Pehk, T., see Lippmaa 5 (1970) 521
Pellois, A. and J. Ripoche, Quasilinear fluorescence spectrum of pyrene trapped in methylcyclopentane at very low temperature 3 (1969) 280
Pennelly, R.R., see Eckhardt 9 (1971) 572
Penneman, R.A., J.B. Mann and C.K. Jørgensen, Speculations on the chemistry of superheavy elements such as Z=164 8 (1971) 321
Perchard, J.P., W.F. Murphy and H.J. Bernstein, Rotational Raman spectra of HCl, DCl, and HBr in solution 8 (1971) 559
Perona, M.J., see Chang 9 (1971) 587
Perrot, M., see Huong 7 (1970) 189
Peterson, E.M., see O'Reilly 8 (1971) 470
Peterson, S.H., see Verdieck 7 (1970) 219
Petrides, D., see Simopoulos 7 (1970) 615
Petrongolo, C., see Bonaccorsi 3 (1969) 473
Pettipiece, K.J., see Gregg 8 (1971) 609
Pettipiece, K.J., see Pan 10 (1971) 577
Petty, F. and T.F. Moran, H_3^+ vibrational frequencies from ion impact spectroscopy 5 (1970) 64
Petty, F., see Moran 9 (1971) 379
Peyerimhoff, S.D., see Buenker 3 (1969) 37
Peyerimhoff, S.D., R.J. Buenker, W.E. Kammer and H. Hsu, Calculation of the electronic spectrum of formaldehyde 8 (1971) 129
Pflüger, E., see Müller 2 (1968) 155
Phillips, J.C., Dielectric definition of ionicity 3 (1969) 286
Phillips, J.C. and J.A. Van Vechten, Heats of formation of tetrahedrally coordinated semiconductors A^MB^{8-M} 5 (1970) 159
Phillips, L.F., see Freeman 5 (1970) 555
Phillips, L.F., see Freeman 6 (1970) 482
Phillips, L.F., see Butchard 8 (1971) 139
Phillips, L.F., see Freeman 8 (1971) 77, 226
Phillips, L.F., see Freeman 9 (1971) 578
Phillips, L.F., see Freeman 10 (1971) 530
Phillips, M.A.K. and R.C. Seymour, The vibrational frequencies of adsorbed SO_2 6 (1970) 553
Philpott, M.R., Approximate form for lattice sums of exciton resonance interactions arising from intense molecular transitions 8 (1971) 477
Piela, L., On the usefulness of approximate exchange integrals in calculations of the long-range forces 7 (1970) 591
Pierotti, R.A., On the virial expansion treatment of physical adsorption 2 (1968) 385
Pierotti, R.A., Second and third order interactions of benzene with graphite. Hindered rotation in physical adsorption 2 (1968) 420

Pilling, M.J., A.M. Bass and W. Braun, Oscillator strengths of CH_2 and CH_3 in the vacuum ultraviolet 9 (1971) 147
Pintar, M.M., see Valic 9 (1971) 362
Pipano, A., R.R. Gilman, C.F. Bender and I. Shavitt, Ab initio calculation of the inversion barrier in ammonia 4 (1970) 583
Pipano, A., R.R. Gilman and I. Shavitt, Invariance of inner shell correlation energy with geometry changes in a polyatomic molecule 5 (1970) 285
Pipano, A. and J.J. Kaufman, Ionization potentials of the N_2O molecule 7 (1970) 99
Pipano, A., see Hosteny 7 (1970) 325
Piseri, L. and G. Zerbi, Vibrational frequency spectra of randomly folded simple zig-zag chains 2 (1968) 127
Pitzer, R.M., see Power 8 (1971) 615
Platt, C.M.R. and D.H. Martin, Spectroscopic determination of the exchange coupling between Ir^{4+} ions in $(NH_4)_2Ir;PtCl_6$ 1 (1968) 659
Plesser, Th., see Lischka 6 (1970) 263
Poindexter, E.H., see Dwek 3 (1969) 283
Polák, R., Hybridization in water molecule 9 (1971) 630
Poland, H.M., see Anderson 8 (1971) 232
Polansky, O.E., see Traunmüller 3 (1969) 300
Polanyi, J.C., Relation between electron affinity or ionization potential, and reaction rate 1 (1967) 421
Polanyi, J.C., see Anlauf 1 (1968) 619
Polezzo, S. and M. Simonetta, Modified Hückel calculation of dipole moments in nitro- and nitro chloro-alkanes 1 (1967) 85
Polezzo, S., P. Cremaschi and M. Simonetta, Modified Hückel molecular orbital calculation of nuclear spin coupling constants in simple hydrocarbons and aldehydes 1 (1967) 357
Politzer, P., Orbital sizes and dipole moments in diatomic hydrides 1 (1967) 227
Politzer, P., see Cusachs 1 (1968) 529
Politzer, P. and L.C. Cusachs, On the electronic density distribution in diborane 2 (1968) 1
Politzer, P. and W.E. Stout Jr., Properties of atoms in molecules. The position of the center of electronic charge of an atom in a molecule 8 (1971) 519
Pomerantz, M., see Japar 2 (1968) 137
Poole, J.A., see Dhingra 2 (1968) 108
Pope, M., see Wotherspoon 5 (1970) 453
Pope, M., see Levin 9 (1971) 210
Pope, N.K., see Leribaux 6 (1970) 447
Popielawski, J., Electrical conductivity in dense metallic vapours 2 (1968) 71
Popkie, H.E., see Moffat 5 (1970) 331
Pople, J.A., J.W. McIver Jr. and N.S. Ostlund, Finite perturbation theory for nuclear spin coupling constants 1 (1967) 465
Pople, J.A., see Hehre 2 (1968) 379
Pople, J.A., see Lathan 3 (1969) 579
Pople, J.A., see Del Bene 4 (1969) 426
Pople, J.A., see Ditchfield 5 (1970) 13
Pople, J.A., see Ditchfield 6 (1970) 573
Poppe, D., see Ottinger 8 (1971) 513
Porter, G., see Godfrey 1 (1967) 490
Porter, G., see Formosinho 6 (1970) 7
Porter, G., see Patterson 7 (1970) 612
Porter, G.B., see Chen 6 (1970) 41

Post, M.F.M., see Werkhoven 9 (1971) 6
Post, M.F.M., J. Langelaar and J.D.W. van Voorst, Singlet excited monomer and excimer absorptions of pyrene 10 (1971) 468
Potashnik, R. and M. Ottolenghi, Absorption spectra of CT complexes in their lowest excited singlet states 6 (1970) 525
Potashnik, R., C.R. Goldschmidt and M. Ottolenghi, Triplet state formation in the quenching of fluorescence by molecular oxygen 9 (1971) 424
Potenza, J.A., see Dwek 3 (1969) 283
Pott, G.T. and B.D. McNicol, The phosphorescence of Fe^{3+} ions in γ-alumina 6 (1970) 623
Power, E.A., see Craig 3 (1969) 195
Power, E.A. and T. Thirunamachandran, On the corrections due to curvature for π-electron energies in large ring molecules 3 (1969) 361
Power, E.A., see Craig 6 (1970) 211
Power, G., see Ciach 9 (1971) 349
Power, J.D. and R.M. Pitzer, Second-order perturbation theory with the contact interaction 8 (1971) 615
Pozzo, A., see De Paz 7 (1970) 23
Prados, R.A., see Clausen III 8 (1971) 565
Praet, M.-Th. and J. Delwiche, Ionization energies of some cyclic molecules 5 (1970) 546
Prasad, P.N., see Hochstrasser 8 (1971) 315
Prasad, P.N., see Hochstrasser 9 (1971) 113
Prášil, Z., see Huy 9 (1971) 476
Prat, R., see Lefebvre 1 (1967) 388
Prater, B.E., see Bancroft 4 (1969) 248
Prelesnik, A., see Blinc 9 (1971) 85
Preston, R., see Krenos 10 (1971) 17
Prestwich, W.V., see Cameron 4 (1969) 229
Preudhomme, J., see Azima 7 (1970) 565
Prigogine, M., On the solid–liquid surface tension and the nature of the liquid state 1 (1967) 446
Primas, H., see Riess 1 (1968) 545
Prins, R., J.D.W. Van Voorst and C.J. Schinkel, Zero-field splitting in the triplet ground state of nickelocene 1 (1967) 54
Prins, R. and F.J. Reinders, Electron spin resonance measurements of dibenzenechromium cation 3 (1969) 45
Prins, R. and T. Novakov, X-ray photoelectron spectra and molecular orbital interpretation of the valence region of ClO_4^- and SO_4^{2-} 9 (1971) 593
Pritchard, R.H., C.F. Bender and C.W. Kern, Fine-structure interactions in the ground state of O_2 5 (1970) 529
Prochorow, J. and R. Siegoczyński, Radiative and radiationless processes in charge-transfer complexes 3 (1969) 635
Provencher, G.M. and D.J. McKenney, Study of the chlorine 2580Å continuum developed in active nitrogen 5 (1970) 26
Provencher, G.M. and D.J. McKenney, CN emission in active nitrogen I. Enhanced violet emission at "low" microwave discharge power 10 (1971) 365
Przeniczny, Z., see Kielich 6 (1970) 72
Pullen, B.P., see Carlson 5 (1970) 390
Pullman, A., see Daudey 5 (1970) 347
Puri, S.P., see Vishwamittar 9 (1971) 495
Puri, S.P., see Malathi 10 (1971) 154

Pyarnpuu, A.A., see Leonas 5 (1970) 567
Pysh, E.S., see Bensing 4 (1969) 120
Pyykkö, P. and B. Pedersen, Measurement of the deuteron quadrupole coupling constant in $LiAlD_4$ 2 (1968) 297
Pyykkö, P., Proton and deuteron spin–lattice relaxation in PH_4I and PD_4I 2 (1968) 559
Pyykkö, P. and J. Linderberg, On nuclear pseudoquadrupole interactions in lithium fluoride and lithium bromide molecules 5 (1970) 34
Pyykkö, P., Effect of nuclear volume on nuclear quadrupole coupling in molecules 6 (1970) 479

Quist, A.S., see Brooker 5 (1970) 357
Quist, A.S., see Brooker 9 (1971) 242

Raab, R.E., see Buckingham 8 (1971) 622
Rabalais, J.W., H.J. Maria and S.P. McGlynn, Comments on phosphorescence decay times of benzene and methylbenzene derivatives 3 (1969) 59
Radhakrishna Setty, D.L., see Gupta 4 (1969) 263
Radom, L., see Ditchfield 5 (1970) 13
Raghunath, K., see Subrahmanyam 2 (1968) 110
Ragle, J.L., see Cornford 5 (1970) 486
Rai, M.M., see Sarin 6 (1970) 473
Raich, J.C., R.D. Etters and L. Flax, On the orientational transition in liquid crystals 6 (1970) 491
Ramachandra Rao, Ch.V.S., see Asundi 4 (1969) 89
Ramachandra Rao, D., see Jha 3 (1969) 175
Ramachandra Rao, D., see Subbaram 4 (1970) 653
Rämme, G., see Fisher 9 (1971) 306, 309
Ranade, A.C., see Muller 3 (1969) 467
Randhawa, H.S., see Rao 7 (1970) 563
Randić, M., see Jakab 6 (1970) 569
Rangarajan, G., see Cowsik 8 (1971) 136
Ranon, U. and D.N. Stamires, Electron spin resonance of Mn^{2+} in CdF_2 2 (1968) 286
Ranon, U., see Danner 2 (1968) 605
Ranon, U. and D.N. Stamires, Determination of the nuclear quadrupole moment ratio of $^{155}Gd/^{157}Gd$ by electron paramagnetic resonance 5 (1970) 221
Ranson, G.S.S. and K.D. Warren, Differential nephelauxetic reduction of the F_2 and F_4 Slater–Condon integrals 10 (1971) 236
Rao, C.N.R., see Rao 1 (1967) 499
Rao, C.N.R., see Murthy 2 (1968) 123
Rao, C.N.R., see Singh 3 (1969) 247
Rao, C.N.R., G.C. Chaturvedi and H.S. Randhawa, Ultraviolet absorption spectra of acetone and acetone-d_6 7 (1970) 563
Rao, K.J. and C.N.R. Rao, Melting of ionic solids and the Born treatment 1 (1967) 499
Rao, K.V.S. and M. Dattatreya Sastry, Line width studies in EPR of VO^{2+} in NH_4Cl single crystal 2 (1968) 20
Rao, K.V.S., Relaxation times of VO^{2+} ion doped in KNO_3 and $CsNO_3$ single crystals 5 (1970) 438
Rao, K.V.S. and K.V.L.N. Sastry, Zero-field paramagnetic resonance of Fe^{3+} in ammonium chloride 6 (1970) 485
Rapp, W., see Lessing 7 (1970) 247
Rapp, W. and B. Gronau, Laser emission from two xanthene dyes via double-photon excitation 8 (1971) 529

Rasaiah, J., The hypernetted chain (HNC) equation for higher valence electrolytes 7 (1970) 260
Erratum 8 (1971) 244
Rassat, A., see Lemaire 2 (1968) 573
Rataiczak, R.D., see Jones 2 (1968) 493
Ratner, M., see Linderberg 6 (1970) 37
Ratner, M.A. and B.R. Sundheim, Spin–rotation effects on radiationless transitions 10 (1971) 56
Rau, J.D., see Anderson 8 (1971) 232
Ravid, B., see Halevi 1 (1967) 475
Ray, G.J., A.K. Colter and R.J. Kurland, Carbon-13 NMR shifts and charge densities in triphenylcyclopropenium cation 2 (1968) 324
Ray, N.K. and P.T. Narasimhan, Unrestricted Hartree–Fock calculations of spin density distributions in some alkyl radicals 2 (1968) 59
Ray, N.K. and P.T. Narasimhan, Unrestricted Hartree–Fock calculations of spin density distributions in some alkyl radicals using the hetero-atom model for the methyl group 2 (1968) 101
Ray, N.K., see Gupta 2 (1968) 150
Ray, N.K., Unrestricted Hartree–Fock calculation of spin densities in some xanthyl radicals 2 (1968) 634
Ray, N.K., Spin density distributions in some fluorinated radical anions 3 (1969) 261
Ray, N.K., Floating spherical gaussian orbital calculation of electric field gradients near the deuteron in CH_3D, H_2CCHD, HCCD 6 (1970) 225
Raz, B. and J. Jortner, Energy of the quasi-free electron state in liquid and solid rare gases 4 (1969) 155
Raz, B., see Miron 6 (1970) 563
Raz, B. and J. Jortner, Energy of the quasi-free electron state in dense neon 9 (1971) 222
Raz, N. and J. Jortner, Wannier type impurity states in liquid rare gases 4 (1970) 511
Razavy, M., see Chan 2 (1968) 202
Read, F.H., see Bardsley 2 (1968) 333
Read, F.H., see Imhof 3 (1969) 652
Reddoch, A.H. and D.H. Paskovich, The EPR spectrum of benzo [cd] pyrenyl 3 (1969) 351
Reddoch, A.H., The effect of ion pairing on the EPR spectrum of the pyracene anion. II 10 (1971) 108
Ree, F.H., see Lee 4 (1969) 379
Ree, T., see Lee 4 (1969) 379
Rees, B., see Veillard 8 (1971) 267
Reesor, G.E., see Dagg 3 (1969) 377
Reeves, L.W., see Shaw 10 (1971) 89
Rehm, D., see Sackmann 4 (1970) 537
Rehm, D., see Beens 8 (1971) 341
Rehm, D. and K.B. Eisenthal, Intermolecular energy transfer studies with picosecond light pulses 9 (1971) 387
Reid, R.H.G. and A. Dalgarno, Sodium ^2P fine-structure transitions in collisions with helium 6 (1970) 85
Reinders, F.J., see Prins 3 (1969) 45
Reiff, W.M., The study of trigonally distorted low spin iron (III) systems using magnetically perturbed Mössbauer spectra 8 (1971) 297
Renne, M.J. and B.R.A. Nijboer, Microscopic derivation of macroscopic van der Waals forces 1 (1967) 317
Renne, M.J., see Nijboer 2 (1968) 35
Renne, M.J. and B.R.A. Nijboer, Van der Waals interaction between two spherical dielectric particles 6 (1970) 601
Erratum 7 (1970) 396
Rentzepis, P.M., Direct measurements of radiationless transitions in liquids 2 (1968) 117
Rentzepis, P.M., see Malley 3 (1969) 534

Rentzepis, P.M., Emission from the lowest singlet and triplet states of azulene 3 (1969) 717
Rentzepis, P.M., see Tobias 4 (1969) 205
Rentzepis, P.M., J. Jortner and R.P. Jones, Observation of fluorescence from transitions between excited electronic states in a large molecule 4 (1970) 599
Rentzepis, P.M., see Malley 7 (1970) 57
Rentzepis, P.M., see Nitzan 8 (1971) 445
Rentzepis, P.M., see Topp 9 (1971) 1
Rentzepis, P.M., see Wannier 10 (1971) 102, 193
Ressayre, E. and B. Lefebvre, On the time evolution of a multi-level system 8 (1971) 553
Rettschnick, R.P.H. and G.J. Hoytink, Collision induced electronic transitions of oxygen 1 (1967) 145
Rettschnick, R.P.H., see Langelaar 1 (1968) 609
Rettschnick, R.P.H., see Geldof 4 (1969) 59
Rettschnick, R.P.H., see Brugman 8 (1971) 263, 574
Rettschnick, R.P.H., see Giling 8 (1971) 457
Rettschnick, R.P.H., see Kloosterboer 8 (1971) 462
Rettschnick, R.P.H., see Werkhoven 9 (1971) 6
Rettschnick, R.P.H., see Geldof 10 (1971) 549
Rey, P., see Lemaire 2 (1968) 573
Reznikov, A.I., see Nikitin 8 (1971) 161
Rice, J.H., see Dugan Jr. 2 (1968) 219
Rice, J.H., see Dugan Jr. 3 (1969) 323
Rice, J.K., see Trajmar 1 (1968) 703
Rice, J.K., see Truhlar 9 (1971) 299
Rice, S.A., see Johnson 1 (1968) 709
Rice, S.A., see Gelbart 6 (1970) 345
Rice, S.A., see Martin 7 (1970) 94
Rice, S.A., see Richards 9 (1971) 444
Rice, W.W., see Jensen 7 (1970) 627
Rice, W.W., see Jensen 8 (1971) 214
Richards, J.L. and S.A. Rice, Radiationless processes in aromatic molecules studied in Shpolskii matrices 9 (1971) 444
Richards, J.T. and J.K. Thomas, The biphotonic photolysis of liquid benzene 5 (1970) 527
Richards, J.T. and J.K. Thomas, Photoionization of molecules in low temperature glasses 8 (1971) 13
Richards, J.T., see Bensasson 9 (1971) 13
Richards, J.T. and J.K. Thomas, Direct observations of solvated electrons in liquid hydrocarbons 10 (1971) 317
Richards, K.H.B., see Mansfield 3 (1969) 169
Richards, P.L., see Brackett 6 (1970) 75
Richardson, F.S., see Shillady 6 (1970) 359
Ridley, B.A. and I.W.M. Smith, The vibrational relaxation of HCl(v=3, 2, and 1) by Cl atoms 9 (1971) 457
Rieckhoff, J.E., see Eisenthal 6 (1970) 441
Riemenschneider, B.R. and N.R. Kestner, Varied portions approach to second order properties involving one-electron operators 5 (1970) 381
Riess, J. and H. Primas, A variational principle for the phase of the wavefunction of molecular systems 1 (1968) 545
Rieter, P.C.U., see Koningsberger 8 (1971) 145

Rigny, P., see Duval 2 (1968) 237
Rigny, P., see Virlet 4 (1970) 501
Rigny, P., see Virlet 6 (1970) 377
Riley, M.E. and A. Kuppermann, Vibrational energy transfer in collisions between diatomic molecules 1 (1968) 537
Riley, M.E. and A. Dalgarno, Perturbation calculations of the helium ground state energy 9 (1971) 382
Rimai, L., see Gill 8 (1971) 634
Rimai, L., M.E. Heyde, H.C. Heller and D. Gill, Raman excitation profiles as probes for inaccessible electronic levels in molecules: retinal, retinol and naphthalene 10 (1971) 207
Rimstidt, J.D., see Sharma 9 (1971) 564
Ripoche, J., see Pellois 3 (1969) 280
Ripoche, J., see Moisan-Pellois 5 (1970) 299
Risen Jr., W.M., see Tsatsas 7 (1970) 354
Risen Jr., W.M., see Exarhos 10 (1971) 484
Ritter, R., see Lombardi 7 (1970) 143
Roach, A.C., On the mechanism of the reaction K + HBr → KBr + H 6 (1970) 389
Roach, A.C. and P. Baybutt, Potential curves of alkali diatomic molecules and the origins of bonding anomalies 7 (1970) 7
Robbins, D.J., see Harding 7 (1970) 70
Robert, D. and L. Galatry, Calculation of infrared band shapes in liquid solutions of diatomic polar molecules in nonpolar solvents 1 (1967) 399
Robert, D. and L. Galatry, A spectroscopic study of the dynamical state of orientation of diatomic polar molecules in liquid non-polar solvents 1 (1968) 526
Robert, D., see Giraud 2 (1968) 551
Robert, D., C. Girardet and L. Galatry, Intermolecular dispersion potential for interactions between linear and spherical molecules 3 (1969) 102
Robert, D., see Galatry 5 (1970) 120
Robert, D., see Bonamy 6 (1970) 591
Roberts, B., see Brinen 3 (1969) 305
Roberts, C., see Whittle 9 (1971) 42
Roberts, H.H.Ff., see Amos 4 (1969) 93
Roberts, M.J., The continuum Coulomb Green functions and classical paths 6 (1970) 46
Roberts, P.J., Three-electron atomic integrals 1 (1967) 56
Roberts, R.E., R.B. Bernstein and C.F. Curtiss, A resonance theory of thermolecular recombination kinetics: $H + H + M \rightarrow H_2 + M$ 2 (1968) 366
Roberts, R.E. and R.B. Bernstein, Rate constant for deuterium atom recombination calculated by the orbiting resonance theory 6 (1970) 282
Roberts, R.E., see Johnson 7 (1970) 480
Robertson, W.W., Possible molecular origin of the 1.08 μ atomic line in the helium afterglow and of the continuum radiation in a helium discharge 3 (1969) 30
Robin, M.B., see Brundle 3 (1969) 292
Robinson, C.C. and J.T. Fournier, Coordination of Yb^{3+} in some inorganic glasses from optical absorption and emission studies 3 (1969) 517
Robinson, G.W., see O'Brien 8 (1971) 79
Robinson, J.S., see Brocklehurst 10 (1971) 277
Roby, K.R., see Brown 1 (1967) 459
Rodgers, M.A.J., see Baxendale 4 (1969) 3
Rodgers, M.A.J., Formation kinetics of the pyrene dimer cation observed by pulse radiolysis 9 (1971) 107

Rokos, K., see Förster 1 (1967) 279
Romanelli, M., see Burlamacchi 10 (1971) 59
Ron, A., see Katz 2 (1968) 189
Ron, A., see Katz 7 (1970) 357
Roncin, J.-Y., N. Damany and B. Vodar, Electronic transitions of CS_2 and OCS trapped in solid matrices and Rydberg series in dense media 3 (1969) 197
Roncin, J.-Y., Intermolecular potential parameters of some electronic excited states of atoms and molecules 3 (1969) 408
Roncin, J.-Y., see Boursey 5 (1970) 584
Ronn, A.M., see Jung 5 (1970) 67
Ronn, A.M., see Lee 7 (1970) 463
Ronn, A.M., see Bates Jr. 8 (1971) 103
Roos, B., see Gelius 4 (1970) 471
Roos, B., see Forsén 6 (1970) 128
Roos, B., see Blomquist 9 (1971) 160
Ros, P., see Jansen 3 (1969) 140
Ros, P., see Van der Lugt 4 (1969) 389
Roscoe, J.M., see Westenberg 7 (1970) 597
Rosen, H., see Shen 1 (1968) 671
Rosenheck, K., see Apfelderfer 6 (1970) 200
Rosenthal, C.M., see Epstein 6 (1970) 551
Rosenthal, C.M., The reduction of the multi-dimensional Schrödinger equation to a one-dimensional integral equation 10 (1971) 381
Rosenwaks, S. and S. Yatsiv, CO chemical laser by flash photolysis of $CS_2 + NO_2$ 9 (1971) 266
Rosmus, P., see Vojtík 9 (1971) 323
Ross, I.G., see Jordan 10 (1971) 572
Ross, K.J., see Jonathan 7 (1970) 497
Ross, K.J., see Jonathan 9 (1971) 217
Rossi, M., see Nordio 1 (1967) 101
Rossi, M., Theory of the deuterium effect on the $J_{^{13}CH}$ coupling constant 2 (1968) 353
Rossi, M. and L. Pasimeni, Isotope effect and temperature effect in the ^2H NMR spectra of partly deuterated hydrates – theoretical treatment 6 (1970) 468
Rossman, G.R., see Schugar 6 (1970) 26
Rotenberg, M., see Micha 6 (1970) 79
Rothenberg, S. and H.F. Schaeffer III, Self-consistent-field potential energy surface in three dimensions for the $Cl + H_2 \rightarrow ClH + H$ chemical reaction 10 (1971) 565
Rothman, W., see Hirayama 5 (1970) 296
Rothschild, W.G., Intermolecular forces and molecular rotation in liquids: the chloroform–benzene complex 9 (1971) 149
Rothstein, E.V., Application of the cell model to the calculation of the physical properties of a gas–solid molecular complex 7 (1970) 232
Rothwell, H.L., see Behnen 8 (1971) 318
Rouweler, G.C.J., Van der Waals forces between fused silica and fused silica covered with a chromium layer 8 (1971) 275
Rovida, G., M. Torrini and E. Zanazzi, Relaxation and atomic vibrations at the Ni(110) surface 3 (1969) 201
Rowe, J.M., see Lechner 4 (1969) 444
Rowland, C.G., Jahn–Teller coupling and the photoelectron spectrum of cyclopropane 9 (1971) 169

Roy, H.P., see Bhattacharyya 4 (1970) 541
Ruby, S.L., P.K. Tseng, Hwa-Sheng Cheng and N.C. Li, Concentration dependence of tin (IV) isomer shifts in ice 2 (1968) 39
Rudziński, W., The gas–solid interactions in physical adsorption of simple gases by porous non-uniform solid surfaces 10 (1971) 183
Ruf, M.W., see Morgenstern 4 (1970) 635
Ruitenberg, G., see Dijkerman 3 (1969) 172
Rundqvist, S., see Wäppling 2 (1968) 160
Rush, J.J., A.J. Melveger, T.C. Farrar and Tung Tsang, Laser-Raman spectra and hindered rotation in the phosphonium halides 2 (1968) 621
Rush, J.J., see Lechner 4 (1969) 444
Rush, J.J., L.W. Schroeder and A.J. Melveger, Infrared and Raman spectra of sodium bifluoride: isotope dilution studies 6 (1970) 533
Russell, B.R., see Iverson 6 (1970) 307
Russell, B.R., see Scott 9 (1971) 375
Russell, R.D., see Badger 1 (1967) 122
Rykov, S.V., see Lippmaa 5 (1970) 521
Rykov, S.V., see Kessenikh 9 (1971) 347

Sackett, P.B. and J.T. Yardley, Radiative lifetime of nitrogen dioxide using a tunable organic dye laser 6 (1970) 323
Sackett, P.B. and J.T. Yardley, Short-lived fluorescence from nitrogen dioxide 9 (1971) 612
Sackmann, E., Electric field induced orientation of liquid crystals and optical absorption experiments 3 (1969) 253
Sackmann, E. and P. Krebs, ESR and optical studies of charge-transfer complexes oriented in liquid crystals 4 (1969) 65
Sackmann, E. and D. Rehm, Fluorescence polarization measurements on molecules oriented in liquid crystals 4 (1970) 537
Sackmann, E., see Beens 8 (1971) 341
Sackmann, E., see Krebs 8 (1971) 417
Sadlej, A.J., Temperature dependence of the fluorescence spectra of weakly coupled dimeric systems 2 (1968) 451
Sadlej, A.J., Corrections to the Karplus–Kolker variation-perturbation scheme 8 (1971) 100
Sagdeev, R.Z. and Yu.N. Molin, Hyperfine interactions with carbon-13 paramagnetic complexes 5 (1970) 471
Saint-Clair, J.L., see Ern 10 (1971) 287
Saito, T., see Evans 4 (1969) 361
Saksena, M.P., see Nain 1 (1967) 125
Saksena, M.P., J.M. Gandhi and V.P.S. Nain, Determination of force constants for the spherically symmetric potential functions 1 (1967) 424
Salahub, D.R. and C. Sandorfy, The far-ultraviolet spectra of some simple alcohols and fluoroalcohols 8 (1971) 71
Salem, L., Conditions for favorable unimolecular reaction paths 3 (1969) 99
Salikhov, K.M., see Milov 8 (1971) 523
Salotto, A.W. and L. Burnelle, Potential energy curves for the HNO molecule 3 (1969) 80
Saluvere, T. and E. Lippmaa, Spin–lattice relaxation of ^{15}N nuclei 7 (1970) 545
Samartsev, V.V., see Nagibarov 5 (1970) 61
Samson, J.A.R., The electronic states of $C_6H_6^+$ 4 (1969) 257

Sander, S.I., see Mason 6 (1970) 620
Sandhu, J.S., see Frost 2 (1968) 663
Sandler, S.I. and J.K. Wheatley, Intermolecular potential parameter combining rules for the Lennard-Jones 6–12 potential 10 (1971) 375
Sandorfy, C., see Lombos 1 (1967) 42, 221,382
Sandorfy, C., see Singh 2 (1968) 507
Sandorfy, C., see Bélanger 3 (1969) 649, 661
Sandorfy, C., see Salahub 8 (1971) 71
Sandorfy, C., see Asselin 8 (1971) 601
Sandorfy, C., see Gilbert 9 (1971) 121
Sano, H., see Stöckler 2 (1968) 448
Santry, D.P., see Keeton 7 (1970) 105
Santucci, S., see Bucci 5 (1970) 605
Saperstein, D., see Levin 9 (1971) 210
Saraf, B.L., see Garg 5 (1970) 591
Sarin, V.N., M.M. Rai, H.D. Bist and D.P. Khandelwal, PR separations and relative Q-branch intensities in infrared band contours of mono-substituted benzenes 6 (1970) 473
Sastry, K.V.L.N., see Narayana 5 (1970) 278
Sastry, K.V.L.N., see Rao 6 (1970) 485
Sato, Y. and S. Tsuchiya, Inter- and intramolecular vibrational energy transfer in a CO_2–N_2 system 5 (1970) 293
Saunders, J. and D.S. Urch, Reactions of hot methyl radicals with alkanes 8 (1971) 277
Saunders, V.R., see Hillier 4 (1969) 163
Saunders, V.R., see Hillier 5 (1970) 384
Saunders, V.R., see Bassett 6 (1970) 253
Saunders, V.R., see Hillier 7 (1970) 323
Saunders, V.R., see Hillier 9 (1971) 219
Sauter, H. and A.C. Albrecht, Electric-field broadening of an electronic transition in azulene 2 (1968) 8
Sauvageau, P., see Lombos 1 (1967) 42, 221,382
Sauvageau, P., see Bélanger 3 (1969) 649
Savage, C.M., see Verdieck 7 (1970) 219
Savoie, R. and R.P. Fournier, Far-infrared spectra of condensed methane and methane-d_4 7 (1970) 1
Savolainen, J., see Lefebvre 3 (1969) 449
Sawatzky, G.A. and F. van der Woude, Covalency effects in divalent iron compounds 4 (1969) 335
Saxena, S.C., see Nain 1 (1967) 46
Saxena, S.C. and B.P. Mathur, Central molecular potentials, combination rules and properties of gases and gas mixtures 1 (1967) 224
Saxena, S.C., see Saxena 2 (1968) 44
Saxena, S.C., Zero-pressure Joule–Thomson coefficient and exponential-six intermolecular potential 4 (1969) 81
Saxena, S.C. and G.P. Gupta, Thermal conductivity of nitrous oxide in the temperature range 50° to 900°C 4 (1969) 291
Saxena, S.C., see Tondon 5 (1970) 619
Saxena, S.C., see Tondon 7 (1970) 621
Saxena, V.K. and S.C. Saxena, Measurement of the thermal conductivity of argon using hot-wire type thermal diffusion columns 2 (1968) 44
Sayer, P., see Gouterman 8 (1971) 126
Sbar, N., see Felder 6 (1970) 385

Sceats, M.G., see Lyons 6 (1970) 217
Schaafsma, T.J., The ESR spectrum of NO_2 in the gaseous state 1 (1967) 16, 76
Schaefer, J. and R. Yaris, A phenomenological treatment of the absolute signs of spin–spin coupling constants 1 (1967) 173
Schaefer, III, H.F. and F.E. Harris, Configuration interaction using open-shell spin-projected functions 1 (1967) 407
Schaefer III, H.F., see Heil 5 (1970) 253
Schaefer III, H.F., see O'Neil 10 (1971) 404
Schaefer III, H.F., see Rothenberg 10 (1971) 565
Schechtman, B.H. and W.E. Spicer, Experimental determination of the optical density of states for phthalocyanine and porphyrins 2 (1968) 207
Scheie, C.E., see O'Reilly 8 (1971) 470
Schempp, E., ^{14}N and ^{35}Cl nuclear quadrupole resonance in nitrogen–chlorine bonds 8 (1971) 562
Schick, J.D. and D. Trivich, Photokinetics in single-crystal cuprous oxide 10 (1971) 465
Schiffer, J., see Kling 3 (1969) 64
Schiller, R., The dielectric constant of dipolar substances in the environment of ions produced by irradiation 5 (1970) 176
Schinkel, C.J., see Prins 1 (1967) 54
Schlag, E.W., see Peatman 3 (1969) 492
Schlag, E.W., see Baer 4 (1969) 243
Schlag, E.W., see Fischer 4 (1969) 393
Schleicher, B.R., see Gregg 8 (1971) 609
Schlick, S., Identification of the O_3^- radical ion in X-irradiated $KClO_3$ 4 (1969) 421
Schlier, Ch. and E. Vietzke, The singlet potential of alkali diatoms 3 (1969) 250
Schlier, Ch., see Kempter 6 (1970) 97
Schmidt, D., see Binsch 1 (1967) 135
Schmidt, G.M.J., see Cohen 7 (1970) 486
Schmidt, J., I.A.M. Hesselmann, M.S. de Groot and J.H. van der Waals, Optical detection of electron resonance transitions in phosphorescent quinoxaline 1 (1967) 434
Schmidt, J. and J.H. van der Waals, Optical detection of zero-field transitions in phosphorescent triplet states 2 (1968) 640
Schmidt, J. and J.H. van der Waals, The structure of the zero-field transitions of phosphorescent quinoxaline 3 (1969) 546
Schmidt, J., see Chan 4 (1969) 269
Schmidt, J., W.S. Veeman and J.H. van der Waals, Microwave induced delayed phosphorescence 4 (1969) 341
Schmidt, J., see Antheunis 6 (1970) 255
Schmidt, J., W.G. van Dorp and J.H. van der Waals, Phosphorescence modulation by coherent coupling to a microwave field 8 (1971) 345
Schmidtke, H.-H., Angular overlap treatment of low symmetry coordination compounds I. Assignment of geometrical isomers of the bis(L-histidinato)-cobalt(III) complex 4 (1969) 451
Schmidtke, H.-H. and C.K. Jørgensen, More or less quadratic diethylenetriamine complexes of palladium(II) 5 (1970) 202
Schmit, J. and J. Heinrichs, On the effect of dipole–quadrupole interaction on the polarizability of crystals 7 (1970) 593
Schneider, A.S., Circular dichroism and optical rotatory dispersion of scattering suspensions 8 (1971) 604
Schneider, B., see Doskočilová 6 (1970) 381
Schneider, B.E., see Bishop 6 (1970) 566
Schneider, B.E., see Bishop 7 (1970) 396
Schneider, S., see Fischer 10 (1971) 392

Schopman, J., see Fournier 9 (1971) 426
Schott, M., see Ern 10 (1971) 287
Schöttler, J., see Held 6 (1970) 304
Schouten, J.A., see Trappeniers 5 (1970) 541
Schrader, D.M., see Lebeda 2 (1968) 91
Schrader, D.M., see Lebeda 2 (1968) 389
Schroeder, L.W., see Rush 6 (1970) 533
Schueller, K., see Wasserman 2 (1968) 259
Schugar, H.J., G.R. Rossman, J. Thibeault and H.B. Gray, Simultaneous pair electronic excitations in a binuclear iron(III) complex 6 (1970) 26
Schuller, G., see Kempter 6 (1970) 97
Schulman, J.M., C.J. Hornback and J.W. Moskowitz, An optimized minimal contracted-gaussian basis set for organic pi-systems 8 (1971) 361
Schumacher, H.J., see von Ellenrieder 9 (1971) 152
Schumann, Chr., see Dreeskamp 1 (1968) 555
Schurath, U., see Becker 8 (1971) 259
Schuster, H., see Briegleb 4 (1969) 53
Schuster, P., An elementary model for calculations of effective nuclear charge values in many electron atoms 1 (1967) 73
Schuster, P. and Th. Funck, LCAO MO description of the different association types of formic acid 2 (1968) 587
Schuster, P., LCAO MO calculations on the enol form of acetylacetone and its metal complexes (LCAO MO studies on molecular structure III) 3 (1969) 433
Schuster, P., see Lischka 6 (1970) 263
Schutte, C.J.H. and A.M. Heyns, Low-temperature infrared studies I. Preliminary communication on the infrared spectrum of ammonium dichromate $(NH_4)_2Cr_2O_7$ 1 (1967) 487
Erratum 1 (1968) 560
Schutte, C.J.H. and A.M. Heyns, Low-temperature infrared studies II. Preliminary communication on the phase transitions of ammonium sulphate and ammonium-d_4 sulphate 1 (1968) 511
Schutte, C.J.H. and A.M. Heyns, Low-temperature infrared studies III. The phase transitions in ammonium-d_4 dichromate 1 (1968) 515
Schutte, C.J.H., Low-temperature infrared studies V. Torsional oscillations and the nuclear-magnetic line-width transition in solids 1 (1968) 585
Schuyler, M.W., see Parmenter 6 (1970) 339
Schuyler, M.W., see Ware 6 (1970) 342
Schwartz, F.P. and A.C. Albrecht, One and two-photon photochemistry in rigid solutions of durene in 3-methylpentane at 77°K 9 (1971) 163
Schwartz, M.E., Local energy examination of accurate variational gaussian wavefunctions for the H-atom ground state 1 (1967) 269
Schwartz, M.E., Direct calculations of binding energies of inner-shell electrons in molecules 5 (1970) 50
Schwartz, M.E., Correlation of 1s binding energy with the average quantum mechanical potential at a nucleus 6 (1970) 631
Schwartz, M.E., Correlation of core electron binding energies with the average potential at a nucleus: carbon 1s and extended Hückel theory valence molecular orbital potentials 7 (1970) 78
Schwarz, J., see Krebs 8 (1971) 417
Schwarz, W.H.E., Electron affinities of the alkali atoms. A model-potential calculation 10 (1971) 478
Schweig, A., Calculation of static electric polarizabilities of closed shell organic π-electron systems using a variation method 1 (1967) 163

Schweig, A., Calculation of static electric higher polarizabilities of closed shell organic π-electron systems using a variation method 1 (1967) 195
Schweig, A., see Kuhn 1 (1967) 255
Schweig, A., Dipole moments and polarizabilities in excited singlet states and the generalized Hellmann–Feynman theorem 3 (1969) 542
Schweig, A., Transition polarizabilities 4 (1969) 266
Schweig, A., see Meyer 9 (1971) 451
Schweinler, H.C., see Huebner 2 (1968) 407
Schwoerer, M. and H. Sixl, Optical spin polarisation in the triplet state of naphthalene 2 (1968) 14
Schwoerer, M., see Hammer 5 (1970) 434
Schwoerer, M., see Sixl 6 (1970) 21
Scoles, G., see Cavallini 7 (1970) 303
Scoles, G., see Cavallini 10 (1971) 22
Scott, A.R., see Singh 2 (1968) 271
Scott, J.D. and B.R. Russell, The vacuum ultraviolet absorption spectrum of 1,1-dichloro–2,2-difluoroethylene 9 (1971) 375
Scullman, R., see Jansson 4 (1969) 188
Searcy, J., K. Wendell, C.R. Mueller and S. Sheen, Quantum undulations in the differential cross section of the argon–argon system and their relationship to the intermolecular potential 8 (1971) 123
Secrest, D., see Johnson 1 (1967) 396
Secrest, D., see Eastes 9 (1971) 508
Seddon, W.A., see Smith 3 (1969) 640
Segel, S.L., R.G. Barnes and R.B. Creel, Chemical shift measurements in the presence of strong nuclear quadrupole couplings 2 (1968) 613
Seip, H.M., see Almenningen 1 (1968) 569
Seip, H.M., T.G. Strand and R. Stølevik, Least-squares refinements and error analysis based on correlated electron diffraction intensities of gaseous molecules 3 (1969) 617
Seip, H.M., see Owen 5 (1970) 162
Seip, H.M., see Clark 6 (1970) 452
Seip, R., see Almenningen 1 (1968) 569
Selin, L.E., see Åsbrink 5 (1970) 192
Selinger, B.K., see Ware 6 (1970) 342
Selinger, B.K., see Knight 10 (1971) 43
Selwyn, J.E. and J.L. Steinfeld, Collision-induced predissociation by van der Waals' interaction 4 (1969) 217
Sermyagin, A.V., see Leonas 8 (1971) 282
Serra, A.M., see Bucci 5 (1970) 605
Serra, A.M., see Bucci 8 (1971) 421
Setser, D.W., see Stedman 2 (1968) 542
Setser, D.W., see Taylor 8 (1971) 51
Setser, D.W., see Chang 9 (1971) 587
Seymour, R.C., see Phillips 6 (1970) 553
Shain, A.L., J.P. Ackerman and M. Warfield Teague, Intramolecular triplet exciton transfer in some noncoplanar aromatic systems 3 (1969) 550
Shain, A.L., see Yaris 3 (1969) 597
Shane, E.C., see Brennen 2 (1968) 143
Shane, E.C. and W. Brennen, The recombination of nitrogen atoms 4 (1969) 31
Shapiro, M., see Levine 2 (1968) 545

Shapiro, M. and R.D. Levine, Dynamics of photodissociation: the quantum mechanical quasi-diatomic model for ICN 5 (1970) 499
Erratum 7 (1970) 156
Shapiro, S.L., see Alfano 8 (1971) 631
Sharf, B. and J. Jortner, Asymmetric vibronic effects on degenerate electronic states 2 (1968) 68
Sharf, B., see Katz 2 (1968) 189
Sharf, B. and R. Silbey, Comments on the vibronic linewidth of an isolated resonance of a higher electronic state 4 (1969) 423
Sharf, B. and R. Silbey, Vibronic line broadening of an isolated resonance 4 (1970) 561
Sharf, B. and R. Silbey, On the effect of deuteration on non-radiative processes in large molecules 5 (1970) 314
Sharf, B., Theoretical discussion of line shapes in the optical and UV spectra of large polyatomic molecules 5 (1970) 456
Sharf, B., The line shape of an inhomogeneously broadened resonance of large poly-atomic molecules 5 (1970) 459
Sharf, B., A novel mechanism for non-radiative decay, line broadening and interference effects 6 (1970) 364
Sharf, B. and B. Honig, Comments on vibronic intensity borrowing 7 (1970) 132
Sharf, B., Evidence for the $1/r_{ij}$ mechanism. Inhomogeneous line broadening in the Rydberg spectrum of naphthalene 8 (1971) 238
Sharf, B., Near resonance interactions in the B–O scheme. The $1/r_{ij}$ mechanism 8 (1971) 391
Sharf, B. and R. Silbey, Near resonance interaction in the B–O scheme. The vibronic mechanism pertinent to radiationless transitions and inhomogeneous line broadening 9 (1971) 125
Sharma, J., R.H. Staley, J.D. Rimstidt, H.D. Fair and T.F. Gora, Effect of doping on the X-ray photoelectron spectra of semiconductors 9 (1971) 564
Sharma, P.K. and N. Singh, Mean square amplitude of thermal vibrations in cubic metals at melting point 4 (1969) 1
Sharma, R.D., First order j-dependent shifts in the infrared and Raman spectra 8 (1971) 428
Sharma, V.K., Configuration interaction effects in the ground state splitting of trivalent gadolinium 4 (1969) 176
Sharma, V.K., EPR study of Gd^{3+} in PrF_3 single crystal 4 (1970) 545
Sharnoff, M., Electron spin resonance and the non-bonding orbitals of the phosphorescent state of pyrazine 2 (1968) 498
Erratum 4 (1969) 162
Sharnoff, M., see Clements 7 (1970) 4
Shavitt, I., see Pipano 4 (1970) 583
Shavitt, I., see Pipano 5 (1970) 285
Shavitt, I., see Hosteny 7 (1970) 325
Shaw, K.N. and L.W. Reeves, A semi-empirical SCF LCAO MO study of the hindered internal rotation in formamide 10 (1971) 89
Shaw, M.J., see Hemsworth 5 (1970) 237
Shaw, M.J., R.C. Bolden, R.S. Hemsworth and N.D. Twiddy, Measurements of the cross section for Penning ionization of H by He 2^3S metastables 8 (1971) 148
Sheen, S., see Searcy 8 (1971) 123
Sheena, H.H., see Harada 1 (1968) 595
Shen, Y.R., H. Rosen and F. Stenman, Frequency shift of the stretching vibration of I_2 in liquid mixtures 1 (1968) 671
Shillady, D.D., see Billingsley II 5 (1970) 97
Shillady, D.D. and F.S. Richardson, A minimum gaussian lobe representation of 3d orbitals 6 (1970) 359

Shimizu, H., Determination of τ_c from observed EPR spectra when $\tau_c^2|H_1|^2 \simeq 1$ 2 (1968) 257
Shin, H.K., On the probability of intermolecular energy transfer in polar molecules 1 (1967) 443
Shin, H.K., Temperature dependence of vibrational transition probabilities in H_2O–H_2O collisions 1 (1968) 635
Shin, H.K., Intramolecular vibration–vibration energy transfer in triatomic molecules 2 (1968) 629
Shin, H.K., Vibrational energy transfer for an impulsive BC + A collision 4 (1969) 297
Shin, H.K., Vibrational excitation of diatomic molecules in high energy ion–molecule collisions 5 (1970) 137
Shin, H.K., Idealized model for the reactive collision AB + C → A + BC 5 (1970) 232
Shin, H.K., Formulation of vibration–rotation energy transfer probability 6 (1970) 494
Shin, H.K., Dependence of vibrational transition probabilities on the orientation angle in the three-dimensional BC + A collision 7 (1970) 436
Shin, H.K., Vibration–rotation–translation energy transfer in HF–HF and DF–DF 10 (1971) 81
Shirom, M., see Bettelheim 9 (1971) 166
Shoemaker, R.L. and W.H. Flygare, Magnetic susceptibility anisotropy and molecular quadrupole moment of fluoroacetylene 2 (1968) 610
Shoemaker, R.L. and W.H. Flygare, Molecular *g*-value, magnetic susceptibility anisotropy, and molecular quadrupole moment in OCSe 6 (1970) 576
Shrivastava, K.N., Evaluation of Debye temperatures as a new application of electron-spin resonances 6 (1970) 545
Shrivastava, K.N., Level shifting effect 7 (1970) 477
Shukla, P.N., see Garg 7 (1970) 494
Shull, H., see Allen 9 (1971) 339
Siddall III, T.H., W.E. Stewart and D.G. Karraker, Evidence for pseudocontact NMR shifts in U(IV) compounds 3 (1969) 498
Siebrand, W., Theoretical evaluation of anharmonic contributions to radiationless transitions in aromatic hydrocarbons 2 (1968) 94
Siebrand, W., see Henry 3 (1969) 90, 327
Siebrand, W., see Munn 3 (1969) 655
Siebrand, W., see Henry 3 (1969) 728
Siebrand, W., Mechanisms of intersystem crossing in aromatic hydrocarbons 6 (1970) 192
Siebrand, W., see Henry 7 (1970) 533
Siebrand, W., see Orlandi 8 (1971) 473
Siebrand, W., On the relation between radiative and nonradiative transitions in molecules 9 (1971) 157
Sieck, L.W., L. Hellner and R. Gorden Jr., Kinetic mass spectrometric determination of the absolute rate coefficient for the reaction NH_3^+ (v=0) + NH_3 → NH_4^+ + NH_2 at thermal kinetic energies 10 (1971) 502
Siegbahn, K., see Hamrin 1 (1968) 557, 613
Siegbahn, P., see Gelius 4 (1970) 471
Siegbahn, P., Ab initio calculations on furan with a new computer program 8 (1971) 245
Siegel, M.M. and M. Lipsicas, Proton magnetic relaxation in the adulterated methane gas system 6 (1970) 259
Siegel, S., see Jones 2 (1968) 486
Siegoczyński, R., see Prochorow 3 (1969) 635
Sikka, S.K., see Chidambaram 2 (1968) 162
Silbey, R., see Sharf 4 (1969, 1970) 423, 561
Silbey, R., see Sharf 5 (1970) 314
Silbey, R., see Sharf 9 (1971) 125

Sillescu, H. and R. Brüssau, NMR-relaxation and solvation dynamics in macro-molecular solutions 5 (1970) 525
Silver, D.M., Basis sets of gaussian and Slater-type atomic orbitals 7 (1970) 511
Silver, D.M., Metric evaluation in the space of exponential and gaussian functions 10 (1971) 227
Silverman, J.N. and J.C. van Leuven, A quantum mechanical curvature theorem 7 (1970) 37
Erratum 7 (1970) 639
Simanek, E. and K.A. Mueller, EPR parameters and ionic-covalent transition in solids 4 (1970) 482
Simonetta, M., see Polezzo 1 (1967) 85, 357
Simonetta, M., see Morosi 8 (1971) 358
Simons, J., Construction of approximately *N*-representable density matrices. Comments on non-orthogonal spin geminals, basis augmentation, and error bounds 10 (1971) 94
Simopoulos, A., H. Wickman, A. Kostikas and D. Petrides, Mössbauer study of the glass transition in methanol 7 (1970) 615
Simov, D., see Galabov 5 (1970) 549
Simpson, A.F., see Atkins 8 (1971) 55
Simpson, J.D., H.W. Offen and J.G. Burr, Effect of partial deuteration on biphenyl phosphorescence 2 (1968) 383
Sims, L.J., A.V. Guzzo and A.B. Denison, Temperature dependent electron relaxation time in the photo-excited triplet state of pyrene-*d*-10 5 (1970) 370
Sinanoğlu, O. and J. Čížek, Reducible and irreducible pair correlations in benzene 1 (1967) 337
Sinanoğlu, O., An intermolecular potential for use in liquids 1 (1967) 340
Sinanoğlu, O. and B. Skutnik, Correlations between tetrahedrally localized orbitals 1 (1968) 699
Singh, A., H.D. Gesser and A.R. Scott, Solvated electron in acetonitrile 2 (1968) 271
Singh, D.C., see Mathur 5 (1970) 249
Singh, H., see Laposa 4 (1969) 288
Singh, K.P. and R.M. Singru, Lifetimes of positrons in alkaline earth fluorides 10 (1971) 328
Singh, N., see Sharma 4 (1969) 1
Singh, R.D., see Gupta 5 (1970) 218
Singh, R.D., see Srivastava 7 (1970) 377
Singh, R.D., see Gupta 7 (1970) 500
Singh, R.D. and V.D. Gupta, Vibrational properties of helical polyglycine 8 (1971) 294
Singh, R.D., see Srivastava 10 (1971) 387
Singh, S. and C. Sandorfy, The electronic spectrum of the photodimer of benzo[a]-anthracene 2 (1968) 507
Singh, S.N., see Taneja 4 (1969) 201
Singh, S.R., see Benesch 10 (1971) 151
Singru, R.M., see Singh 10 (1971) 328
Šišková, J., see Horák 6 (1970) 375
Sitters, R., see van Voorst 1 (1967) 321
Sitz, P. and R. Yaris, The choice of trial functions in the perturbation-variation method 1 (1967) 177
Sixl, H., see Schwoerer 2 (1968) 14
Sixl, H., see Hammer 5 (1970) 434
Sixl, H. and M. Schwoerer, Dynamics of optical electron spin-polarization in naphthalene. Magnetic field effects on phosphorescence 6 (1970) 21
Skibowski, M., see Koch 9 (1971) 429
Skibowski, M., see Haensel 9 (1971) 548
Sköld, K., see Lechner 4 (1969) 444
Skutnik, B., see Sinanoğlu 1 (1968) 699
Slabbert, N.P., see Du Plessis 1 (1967) 301

Slanger, T.G. and G. Black, The perturbation spectrum of CO 4 (1970) 558
Slater, D.H., see Jonathan 7 (1970) 257
Slifkin, M.A., The infrared spectra of hydrocarbon quinone complexes 7 (1970) 195
Slifkin, M.A., The nature of the binding forces in purine hydrocarbon and purine riboflavin complexes 9 (1971) 416
Sloop, D.J., see Brown 1 (1967, 1968) 167, 579
Small, G.J., Triplet factor group states in aromatic hydrocarbon crystals 1 (1968) 605
Smith, A.L., see Waggoner 3 (1969) 151
Smith, A.L., see Michaelson 6 (1970) 1
Smith, A.L., see Chow 7 (1970) 127
Smith, B.E. and M. Gouterman, Quartet luminescence from copper porphyrins 2 (1968) 517
Smith, D., see Jonathan 7 (1970) 497
Smith, D., Molecular motion in solid methane 10 (1971) 174
Smith, D.J., see Jonathan 9 (1971) 217
Smith, D.R. and W.A. Seddon, ESR detection of N_2C^+ in γ-irradiated N_2O at 77°K 3 (1969) 640
Smith, D.W., On the assignment of the eletronic spectrum of gaseous $CuCl_2$ 6 (1970) 83
Smith, E.B., see Gasser 1 (1967) 457
Smith Jr., F.C., see Johnson 7 (1970) 541
Smith Jr., F.C., see Johnson 10 (1971) 219
Smith, G.K., see Fisher 6 (1970) 438
Smith, H.O., see Kollmar 5 (1970) 7
Smith, I.W.M., see Hancock 3 (1969) 573
Smith, I.W.M., see Hancock 8 (1971) 41
Smith, I.W.M., see Ridley 9 (1971) 457
Smith, J.A.S., see Clifford 1 (1967) 185
Smith, J.H., see Sohn 6 (1970) 499
Smith, N.A., see Claxton 4 (1970) 505
Smith, P.M., see Chantry 10 (1971) 473
Smith Jr., V.H., Asymptotic behaviour of incoherent scattering functions 7 (1970) 226
Smith Jr., V.H., Cusp conditions for natural functions 9 (1971) 365
Smith Jr., V.H., see Benesch 10 (1971) 151
Smith, Wm.H., Mean vibrational amplitudes of the (O. . . O) and (S. . . S) distances for carbon suboxide and carbon subsulfide 3 (1969) 430
Smith, Wm.H., Spectroscopic investigation of the structure of low temperature modification of the crystalline phase of acetylene and acetylene-D_2 3 (1969) 464
Smith Jr., W.H., see Benesch 5 (1970) 601
Smoes, S., C.E. Myers and J. Drowart, Determination of the atomization energies of CP, C_2P, CP_2 and C_2P_2 by high temperature Knudsen cell mass spectrometry 8 (1971) 10
Snavely, B.B., see Bücher 3 (1969) 508
Snelling, D.R., Production of singlet oxygen in the benzene oxygen photochemical system 2 (1968) 346
Snelling, D.R., see Findlay 3 (1969) 204
Snelling, D.R., see Gauthier 5 (1970) 93
Snelling, D.R. and M. Gauthier, Efficiency of $O_2(^1\Sigma_g^+)$ formation by $O(^1D) + O_2$ 9 (1971) 254
Snider, R.F., see Moraal 9 (1971) 401
Snyder, L.C., see Basch 3 (1969) 333
Sohn, Y.S., D.N. Hendrickson, J.H. Smith and H.B. Gray, Single-crystal electronic spectrum of ferrocene at 4.2°K 6 (1970) 499
Šolc, M., Generalized formula for the unimolecular rate constant 1 (1967) 160
Solomon, C.E., see Hall 4 (1969) 352

Sommer, U., see Klasinc 3 (1969) 107
Sommer, U., Radiationless transitions in alternant hydrocarbons 8 (1971) 111
Somorjai, R.L., Integral transform functions. A new class of approximate wave functions 2 (1968) 399
Somorjai, R.L., Integral transform functions. A simple non-exponential orbital for the He series 3 (1969) 395
Somorjai, R.L., see Yue 5 (1970) 537
Sonnich Mortensen, O. and J.A. Koningstein, Vibronic coupling and the electronic Raman effect 1 (1967) 409
Sonnich Mortensen, O., see Koningstein 1 (1968) 693
Sonnich Mortensen, O., Determination of electronic symmetries from polarized Raman spectra 3 (1969) 4
Sonnich Mortensen, O., Depolarization ratios in resonance Raman scattering 5 (1970) 515
Sørensen, G.O., Calculation of nuclear quadrupole splittings in microwave spectroscopy 5 (1970) 322
Soriano, J., see Bukshpan 4 (1969) 241
Spears, K.G., see Gelbart 6 (1970) 345
Spedding, F.H., see Syme 2 (1968) 132
Speier, F., see Comes 4 (1969) 13
Speiser, S. and S. Kimel, On the possibility of observing photochemical reactions induced by multiphoton absorption 7 (1970) 19
Spicer, W.E., see Schechtman 2 (1968) 207
Sprague, E.D., K. Takeda and F. Williams, The dimer radical anion of acetonitrile 10 (1971) 299
Sprevak, D., see Bates 10 (1971) 428
Springett, B.E., see Harrison 10 (1971) 418
Srinivasan, R., see Dalal 4 (1969) 97
Srinivasan, R., see Cowsik 8 (1971) 136
Srinivasan, T.M., see Narayana 5 (1970) 278
Srivastava, S.P. and R.D. Singh, Lattice vibrational spectra and Grüneisen parameter of some metal oxides 7 (1970) 377
Srivastava, S.P. and R.D. Singh, Multiphonon absorption bands in MgO 10 (1971) 387
Stacy, W.T., see Swenberg 2 (1968) 327
Staemmler, V., see Dyczmons 5 (1970) 361
Staemmler, V., see Gelus 7 (1970) 503
Staerk, H., see Nickel 4 (1969) 27
Staley, R.H., see Sharma 9 (1971) 564
Stamires, D.N., see Ranon 2 (1968) 286
Stamires, D.N., see Danner 2 (1968) 605
Stamires, D.N., see Ranon 5 (1970) 221
Stanislaus, J., see Lim 6 (1970) 195
Stanley, C.C., see Kropp 9 (1971) 534
Stanton, L., see Hyatt 10 (1971) 10
Staples, T.L., see Adams 5 (1970) 474
Stecki, J. and R. Wojnar, Kinetic equation for the self-correlation function $G_s(r, t)$ in the dilute Boltzmann gas 2 (1968) 343
Stecki, J., see Altenberger 5 (1970) 29
Stecki, J. and M.A. Narbutowicz, Generalization of Vineyard's convolution approximation 5 (1970) 345
Stedman, D.H., see Clyne 1 (1967) 36
Stedman, D.H. and D.W. Setser, Chemical applications of metastable argon atoms II. A clean system for the formation of $N_2(A^3\Sigma_u^+)$ 2 (1968) 542
Stedman, D.H., D. Steffenson and H. Niki, The reaction between active hydrogen and Cl_2. Evidence for the participation of vibrationally excited H_2 7 (1970) 173

Stedman, M., Effect of the electrical double layer on the reflectance and ellipsometry of electrolyte–conductor interfaces 2 (1968) 457
Steel, C., see Naqvi 6 (1970) 29
Steffenson, D., see Stedman 7 (1970) 173
Stegemeyer, H. and K.-J. Mainusch, Optical rotatory power of liquid crystal mixtures 6 (1970) 5
Stegemeyer, H., see Klueger 8 (1971) 279
Stegemeyer, H., K.-J. Mainusch and E. Steigner, Optical rotatory power of liquid crystal mixtures. II. Mixtures of a nematogenic and a non-mesomorphic chiralic compound 8 (1971) 425
Steigner, E., see Stegemeyer 8 (1971) 425
Stein, G., see Fischer 2 (1968) 405
Stein, G., see Haas 3 (1969) 313
Stein, G., see Berlman 4 (1969) 338
Stein, G., see Goldschmidt 6 (1970) 299
Stein, G., see Haas 8 (1971) 366
Steinborn, O., Poly-polar expansions for regular and irregular spherical harmonics in molecules 3 (1969) 671
Steinfeld, J.I., see Selwyn 4 (1969) 217
Steinfeld, J.I., see Degenkolb 8 (1971) 288
Steinfeld, J.I., see Yardley 10 (1971) 266
Stell, G., Upper bounds on the Helmholtz free energy 4 (1970) 651
Stenhouse, I.A., see Branton 3 (1969) 581
Stenhouse, I.A., see Frost 4 (1970) 533
Stenhouse, I.A., see Branton 5 (1970) 1
Stenhouse, I.A., see Frost 5 (1970) 291
Stenhouse, I.A., see Cornford 5 (1970) 486
Stenman, F., see Shen 1 (1968) 671
Stephens, P.J., Excited state magnetic moments through moment analysis of magnetic circular dichroism 2 (1968) 241
Stephens, P.J., see LoMenzo 9 (1971) 332
Stephens, R.J., see Kent 10 (1971) 201
Stephenson, J.C., see Hao-Lin Chen 2 (1968) 593
Stevens, B. and B.E. Algar, Quantum yield of triplet state formation from naphthacene photoperoxidation 1 (1967) 58
Stevens, B. and B.E. Algar, Intersystem crossing yields in anthranthrene and perylene from photosensitized peroxidation 1 (1967) 219
Erratum 1 (1967) 504
Stevens, B. and M.F. Thomaz, Double intersystem-crossing in 3-bromopyrene 1 (1968) 535
Stevens, B. and M.F. Thomaz, Double intersystem-crossing in naphthalene and 1-chloro-naphthalene 1 (1968) 549
Stevens, B., Solute re-encounter probabilities from delayed excimer fluorescence 3 (1969) 233
Stevens, R.M., see Laws 4 (1969) 159
Stewart, W.E., see Siddall III 3 (1969) 498
Stillinger, F.H., see Hankins 4 (1970) 527
Stockbauer, R., see Villarejo 2 (1968) 11
Stockburger, M., see Blondeau 8 (1971) 436
Stöckler, H.A. and H. Sano, Influence of intermolecular bonding on the temperature dependence of the anisotropic Lamb-Mössbauer factor 2 (1968) 448
Stoeckli, H.F., The freezing points of *n*-alkanes and *n*-alcohols 1 (1967) 99
Stølevik, R., see Seip 3 (1969) 617

Stone, A.J., Improvement of resolution of Mössbauer and other spectra by Fourier transform techniques 6 (1970) 331
Stone, A.J., see Curran 8 (1971) 451
Stout Jr., E.W., see Politzer 8 (1971) 519
Strand, T.G., see Seip 3 (1969) 617
Streitwieser Jr., A., see Edelstein 8 (1971) 399
Strong, R.L., see Nordin 2 (1968) 429
Struve, W.S., Semi-empirical pseudopotential calculations of alkali dimer-ion dissociation energies 7 (1970) 382
Stuhl, F. and H. Niki, Formation of metastable $N_2(A^3\Sigma_u^+)$ in the charge transfer reaction of N_2 with NO 4 (1969) 417
Stuhl, F. and H. Niki, Absolute rate constants for the quenching of $O_2(b^1\Sigma_g^+)$ by unsaturated hydrocarbons 5 (1970) 573
Stuhl, F. and H. Niki, Detection of oxygen (^3P) atoms in pulsed vacuum UV photolysis of NO and its application to O atom reactions 7 (1970) 197
Stuhl, F. and H. Niki, Kinetic isotope effects in the quenching of $O_2(b^1\Sigma_g^+)$ by some deuterated compounds 7 (1970) 473
Sturgeon, G.D., see Eckhardt 8 (1971) 300
Stwalley, W.C., The dissociation energy of the hydrogen molecule using long-range forces 6 (1970) 241
Stwalley, W.C., Long-range analysis of the internuclear potential of Mg_2 7 (1970) 600
Suart, R.D., G.H. Kimbell and S.J. Arnold, Continuous-wave stimulated emission in flowing carbon disulphide–oxygen mixtures 5 (1970) 519
Suart, R.D., S.J. Arnold and G.H. Kimbell, Power enhancement of a CO chemical laser by the addition of vibrationally cool gases 7 (1970) 337
Subbaram, K.V. and D. Ramachandra Rao, Electronic spectrum of NSe 4 (1970) 653
Subrahmanyam, S.V. and K. Raghunath, Excess isothermal compressibility and excess molar heat capacity of the system benzene + *n*-heptane 2 (1968) 110
Subramanian, J., see Gupta 2 (1968) 150
Sun, T.S., see Anderson 6 (1970) 611
Sun, T.S., see Anderson 8 (1971) 537
Sundbom, M., see Blomquist 9 (1971) 160
Sundheim, B.R., see Ratner 10 (1971) 56
Sung, C.C., Nuclear magnetic resonance in liquid crystals 10 (1971) 35
Sutcliffe, B.T., see Kari 7 (1970) 149
Svare, I., see Grasdalen 3 (1969) 452
Swain, J., see Davies 2 (1968) 42
Swanson, D., see Kroll 9 (1971) 115
Swenberg, C.E. and W.T. Stacy, Bimolecular radiationless transitions in crystalline tetracene 2 (1968) 327
Swenson, J.R., see Jordan 10 (1971) 572
Syme, R.W.G., W.J. Haas, F.H. Spedding and R.H. Good Jr., Ratios of odd-parity crystal-field parameters for erbium ethylsulfate 2 (1968) 132
Szentpály, L.V., see Mann 8 (1971) 82
Szöke, A., E. Courtens and A. Ben-Reuven, Orientational order in dipolar liquids 1 (1967) 87
Szwarc, M., see Adams 5 (1970) 474
Szwarc, M., see Fisher 9 (1971) 306, 309

Tabisz, G.C., Pressure dependence of the electronic transition $^1\Sigma_g^+ \leftarrow 3\Sigma_g^-$ in the absorption spectrum of compressed oxygen 9 (1971) 581

Tae-Kyu Ha and C.T. O'Konski, Inner electron binding energy in atoms and ions 3 (1969) 603
Tait, J.H., see Burke 1 (1967) 345
Takahata, Y. and R.G. Parr, On the quantum-mechanical virial theorem for molecular bending motions 4 (1969) 109
Takeda, K., see Bonin 2 (1968) 363
Takeda, K., see Sprague 10 (1971) 299
Takeno, S., Exciton impurity states in an aperiodic polymer 2 (1968) 579
Takeshita, T. and N. Hirota, Signs of alkali metal splittings and the structures of ion pairs of radical ions 4 (1969) 369
Tamir, M. and M. Ottolenghi, Laser-induced photoconductivity in non-polar solutions of TMPD 6 (1970) 369
Tanaka, S., see Tsubomura 1 (1967) 309
Taneja, S.P. and S.N. Singh, On the *g*-tensor and anisotropy of paramagnetic susceptibility of Nd^{3+} ion in $La_2(SO_4)_3.9H_2O$ 4 (1969) 201
Taneja, S.P., see Vishwamittar 9 (1971) 495
Tang, S.Y., see Micha 8 (1971) 587
Tapia, O., Intermolecular interactions. Potential energy curves for H_2–H_2 system in two different MO basis sets 10 (1971) 613
Taylor, A.H., Line-profiles in the quasi-linear spectra of organic molecules in *n*-paraffin solid solutions 5 (1970) 111
Taylor, A.J. and F.A. Gianturco, Anharmonicity effect on vibrational relaxation in carbon monoxide 4 (1969) 376
Taylor, G.N., Emission from aromatic hydrocarbon-diene and -olefin exciplexes 10 (1971) 355
Taylor, G.W. and D.W. Setser, Chemical applications of metastable argon atoms. Generation, identification and characterization of $CO(a^3II)$ 8 (1971) 51
Taylor, N.F., see Davison 3 (1969) 424
Taylor, W.J., Evaluation in closed form of integrals of products of spherical Bessel functions related to the bipolar expansion 3 (1969) 512
Erratum 4 (1970) 526
Teather, G.G., see Gillis 10 (1971) 481
Temme, F.P., see Lee 10 (1971) 251
Ten Brink, H., see Langelaar 7 (1970) 368
Tench, A.J. and T. Lawson, The formation of O^- and O_3^- adsorbed on an oxide surface 7 (1970) 459
Tench, A.J. and T. Lawson, Oxygen species adsorbed on zinc oxide 8 (1971) 177
Ten Seldam, C.A., see Trappeniers 5 (1970) 541
Ten Seldam, C.A., see Trappeniers 8 (1971) 327
Terasaka, T. and T. Matsushita, Spin-projected random-phase-approximation 4 (1969) 384
Tetreau, C., see Lavalette 9 (1971) 319
Tewari, K.K., see Jain 10 (1971) 487
Tews, K.H., see Inacker 7 (1970) 213
Thibeault, J., see Schugar 6 (1970) 26
Thirunamachandran, T., see Power 3 (1969) 361
Thirunamachandran, T., see Craig 6 (1970) 211
Thirunamachandran, T., see Mitchell 6 (1970) 407
Thistlethwaite, P., see Ciach 9 (1971) 349
Thomaes, G., see Legros 1 (1968) 696
Thomaes, G., see Legros 2 (1968) 249, 251

Thomaes, G., see Legros 4 (1970) 632
Thomas, G.E., see Brion 3 (1969) 600
Thomas, H.T., see Chandross 9 (1971) 393, 397
Thomas, I.L., The protonic structure of methane, ammonia, water, and hydrogen fluoride 3 (1969) 705
Thomas, J.K., see Richards 5 (1970) 527
Thomas, J.K., see Richards 8 (1971) 13
Thomas, J.K., see Bensasson 9 (1971) 13
Thomas, J.K., see Richards 10 (1971) 317
Thomas, J.M., see Adams 10 (1971) 297
Thomas, J.M., see Bach 10 (1971) 547
Thomas, P.M., see Dézsi 9 (1971) 390
Thomas, S.J., see Gregg 8 (1971) 609
Thomaz, M.F., see Stevens 1 (1968) 535, 549
Thompson, B.V., see Bullough 2 (1968) 293
Thompson, K.H., see Fyfe 5 (1970) 215
Thomson, A.J., see Harding 7 (1970) 70
Thorhallsson, J. and D.P. Chong, Application of virial scaling to calculation of diatomic forces and force constants 4 (1969) 405
Thornton, D.A., see Du Plessis 1 (1967) 301
Thran, D., see Becker 6 (1970) 583
Thrush, B.A., see McKenzie 1 (1968) 681
Thrush, B.A., see Atkinson 3 (1969) 684
Thrush, B.A., see Derwent 6 (1970) 115
Thrush, B.A., see Clough 7 (1970) 86
Thrush, B.A., see Golde 8 (1971) 375
Thrush, B.A., see Curran 8 (1971) 451
Thrush, B.A., see Campbell 8 (1971) 612
Thrush, B.A., see Derwent 9 (1971) 591
Thulstrup, E.W. and J.H. Eggers, Moment directions of the electronic transitions of fluoranthene 1 (1968) 690
Thulstrup, E.W., M. Vala and J.H. Eggers, Moment directions of the electronic transitions of para-dimethoxybenzene 7 (1970) 31
Thulstrup, P.W., Y. Öhrn and J. Linderberg, Hall's variational principle for excited states 9 (1971) 485
Tiberghien, A. and G. Delacôte, Evaluation of the crystalline tetracene triplet Davydov splitting 8 (1971) 88
Tiberghien, A., Ph. Devaux and G. Delacôte, Multi-centre contributions to the triplet exchange integral in some aromatic hydrocarbon crystals 9 (1971) 642
Tiernan, T.O., see Lifshitz 7 (1970) 469
Tiezzi, E., see Burlamacchi 4 (1969) 173
Tigelaar, H.L. and W.H. Flygare, The sign of the nuclear spin–rotation constants of H in SiH_4 and GeH_4 and ^{19}F in CF_4, SiF_4, GeF_4 7 (1970) 254
Tinland, B., An ab initio SCF LCAO MO study of the electronic structure of ammonia 2 (1968) 433
Tinti, D.S., see El-Sayed 3 (1969) 339
Tinti, D.S., M.A. El-Sayed, A.H. Maki and C.B. Harris, Phosphorescence-microwave double-resonance (PMDR) spectroscopy 3 (1969) 343
Tinti, D.S., see Harris 4 (1969) 409
Tinti, D.S., see Kuan 4 (1970) 507
Tinti, D.S., see El-Sayed 6 (1970) 395

Tinti, D.S., see Gwaiz 9 (1971) 454
Tobias, I., P.M. Rentzepis and N.L. Balazs, Short-time effects in light absorption 4 (1969) 205
Toennies, J.P., see von Seggern 5 (1970) 613
Toennies, J.P., see Held 6 (1970) 304
Tomášek, M., see Vojtík 6 (1970) 189
Tomasi, J., see Bonaccorsi 3 (1969) 473
Tomkiewicz, M., Numerical calculations on non-linear quenching of luminescence in solutions 4 (1969) 179
Tomkiewicz, M. and M. Cocivera, Nuclear spin polarization in radical reactions 8 (1971) 595
Tomkiewicz, M., A. Groen and M. Cocivera, Photochemistry of di-*t*-butyl ketone studied by NMR spectroscopy 10 (1971) 39
Tomkiewicz, Y., see Loewenthal 2 (1968) 29
Tomkiewicz, Y., see Goldschmidt 2 (1968) 520, 536
Tomkiewicz, Y., see Berlman 2 (1968) 657
Tomkiewicz, Y. and A. Weinreb, On the decay time of pyrene in a liquid crystal 3 (1969) 229
Tomkiewicz, Y., see Berlman 4 (1969) 338
Tomlinson, R.H., see Gray 3 (1969) 523
Tomlinson, R.H., see Gray 4 (1969) 251
Tondon, P.K. and S.C. Saxena, Thermal conductivity of quaternary mixtures 5 (1970) 619
Tondon, P.K. and S.C. Saxena, Thermal conductivity of ternary gas mixtures 7 (1970) 621
Topp, M.R., see Patterson 7 (1970) 612
Topp, M.R., P.M. Rentzepis and R.P. Jones, Time resolved picosecond emission spectroscopy of organic dye lasers 9 (1971) 1
Torihashi, Y., see Mataga 1 (1967) 385
Torrini, M., see Rovida 3 (1969) 201
Toth, M., see Bertrand 5 (1970) 183
Toyota, A., see Nakajima 3 (1969) 272
Toyota, A. and T. Nakajima, The ground-state electronic properties of cation and anion radicals of heptafulvalene, pentafulvalene and triafulvalene 6 (1970) 144
Trabjerg, I., see Krause 3 (1969) 297
Trajmar, S., J.K. Rice, P.S.P. Wei and A. Kuppermann, Triplet states of acetylene by electron impact 1 (1968) 703
Trajmar, S., see Truhlar 9 (1971) 299
Trappeniers, N.J., J.A. Schouten and C.A. Ten Seldam, Gas–gas equilibrium and the two-component lattice-gas model 5 (1970) 541
Trappeniers, N.J., G. de Brouckère and C.A. Ten Seldam, Molecular orbital calculations on some copper complexes 8 (1971) 327
Traunmüller, R., O.E. Polansky, P. Heimbach and G. Wilke, Stereoelectronic control in transition metal complexes 3 (1969) 300
Treinin, A., see Amichai 3 (1969) 611
Trencséni, J., see Briegleb 3 (1969) 146
Trinajstić, N., see Živković 2 (1968) 369
Trinajstić, N., The spin density distribution in the benzyl radical 10 (1971) 172
Trivich, D., see Schick 10 (1971) 465
Trommsdorff, H.P., Zeeman effect and singlet-triplet absorption spectrum of p-benzoquinone single crystals 1 (1967) 214
Trommsdorff, H.P., Observation of the two n-π singlet states in the single crystal absorption spectrum of *p*-benzoquinone and toluquinone 10 (1971) 176
Trommsdorff, H.P. and D. Mentzafos, Observation of a magnetic dipole transition in the n-π^* singlet–singlet absorption spectrum of duroquinone 10 (1971) 569

Tromp, N.F.M., see Lagendijk 6 (1970) 152
Truax, D.R., see Dahl 6 (1970) 64
Truhlar, D.G. and A. Kuppermann, A test of transition state theory against exact quantum mechanical calculations 9 (1971) 269
Truhlar, D.G., J.K. Rice, S. Trajmar and D.C. Cartwright, The importance of polarization for electron scattering in the intermediate energy region 9 (1971) 299
Tsapline, B., Expectation values in one-and two-electron atomic systems 6 (1970) 596
Tsatsas, A.T. and W.M. Risen Jr., Cation motion in ionic copolymers 7 (1970) 354
Tseng, P.K., see Ruby 2 (1968) 39
Tseng, T.J., see Grein 7 (1970) 506
Tsien, T.P. and R.T Pack, Rotational excitation in molecular collisions: a strong coupling approximation 6 (1970) 54
Tsien, T.P. and R.T Pack, Rotational excitation in molecular collisions. Corrections to a strong coupling approximation 6 (1970) 400
Tsien, T.P. and R.T Pack, Rotational excitation in molecular collisions. A many-state test of the strong coupling approximation 8 (1971) 579
Tsu-Chia Shieh, see Yang 3 (1969) 6
Tsu-Chia Shieh, see Yang 5 (1970) 60
Tsubomura, H., N. Yamamoto and S. Tanaka, Transient absorption spectra of benzophenone studied by the flash excitation 1 (1967) 309
Tsubomura, H., see Nakato 2 (1968) 57
Tsubomura, H., see Ishida 9 (1971) 296
Tsubomura, H., see Muto 9 (1971) 597
Tsubomura, H., see Nakato 9 (1971) 615
Tsuchiya, S., see Sato 5 (1970) 293
Tsuda, M., see Kawamura 5 (1970) 80
Tsuji, K., see Lin 1 (1967) 66
Tsuji, K., see Bonin 2 (1968) 363
Tsvetkov, Yu.D., see Milov 8 (1971) 523
Tuan, D.F.-T., The geometric approximation of physical properties 7 (1970) 115
Tully, F.P., Y.T. Lee and R.S. Berry, Crossed molecular beam study of collision-induced dissociation of alkali halides 9 (1971) 80
Tully, J., see Krenos 10 (1971) 17
Tung Tsang, see Rush 2 (1968) 621
Turner Jr., C.E., see Pan 10 (1971) 577
Turner, D.W., see Brundle 3 (1969) 292
Turner, D.W., see Evans 4 (1969) 361
Turner, G.E., see Goodman 5 (1970) 181
Turner, G.S., see Moran 9 (1971) 379
Turq, P., Statistical approach to the relaxation effect of the self-diffusion in electrolytes 5 (1970) 432
Twiddy, N.D., see Hemsworth 5 (1970) 237
Twiddy, N.D., see Shaw 8 (1971) 148
Tychinskii, V.P., see Babenko 8 (1971) 598
Tyrrell, H.J.V., see Belton 4 (1970) 619
Tyutyulkov, N., A. Gochev and F. Fratev, An approximation of the two-center Coulomb integral in the semi-empirical LCAO MO methods 4 (1969) 9

Ultee, C.J. and C.R. Kepford, The stability of hydrogen atoms in irradiated aqueous solutions 3 (1969) 337
Ultee, C.J., see Naegeli 6 (1970) 121
Umegaki, H., see Kominami 9 (1971) 510
Upreti, G.C., see Pandey 3 (1969) 526
Upreti, G.C., see Janakiraman 4 (1970) 550
Urch, D.S., see Saunders 8 (1971) 277
Uy, J.O. and E.C. Lim, Electronic relaxation in naphthalene vapor 7 (1970) 306

Vala, M., see Thulstrup 7 (1970) 31
Valbusa, U., see Cavallini 7 (1970) 303
Valbusa, U., see Cavallini 10 (1971) 22
Valic, M.I., S. Gornostansky and M.M. Pintar, Strong collison limt of spin–lattice relaxation in hexagonal ice 9 (1971) 362
Vallauri, M.E., see De Paz 7 (1970) 23
Van Aalst, R.M., see Van Kreveld 4 (1970) 580
Van Bellinghen, J.P., see Vander Donckt 7 (1970) 630
Van den Bergh, H.E., A.B. Callear and R.J. Norstrom, An experimental determination of the oscillator strength of the 2160 Å band of the free methyl radical and a spectroscopic measurement of the combination rate 4 (1969) 101
Van den Bergh, H.E., see Callear 5 (1970) 23
Van den Bergh, H.E., see Callear 8 (1971) 17
Vander Auwera-Mahieu, A. and J. Drowart, The dissociation energies of the molecules PtC and RhC 1 (1967) 311
Vander Auwera-Mahieu, A., N.S. McIntyre and J. Drowart, Mass spectrometotic determination of the dissociation energies of the gaseous molecules FeSi, CoSi and NiSi 4 (1969) 198
Van der Avoird, A., Intermolecular interactions by perturbation theory including exchange effects 1 (1967) 24
Van der Avoird, A., Note on a perturbation theory for intermolecular interactions in the wave operator formalism 1 (1967) 411
Van der Avoird, A., Wave operator perturbation theory for intermolecular interactions, a test on H_2^+ 1 (1967) 429
Vander Donckt, E., J. Nasielski, J.R. Greenleaf and J.B. Birks, Fluorescence of the helicenes 2 (1968) 409
Van der Donckt, E. and J.P. van Bellinghen, Quenching of singlet and triplet excited states of anthracene by organometallic compounds 7 (1970) 630
Van der Elsken, J., see Kroon 1 (1967) 285
Van der Elsken, J., see Van Kreveld 1 (1968) 532
Van der Elsken, J., see Wegdam 2 (1968) 182
Van der Elsken, J., see Van Kreveld 4 (1970) 580
Van der Hart, W.J., ESR spectra of some chlorine-substituted triphenylmethyl radicals 1 (1967) 233
Van der Kooy, J., N.H. Velthorst and C. MacLean, A spectroscopic study of the carbonians of 4,5-methylenephenanthrene and related compounds 3 (1969) 12
Van der Lugt, W.Th.A.M. and P Ros, Retention and inversion in bimolecular substitution reactions of methane 4 (1969) 389
Van der Lugt, W.Th.A.M., Molecular-orbital calculations on transition-metal complexes: charge-transfer transitions and the interpretation of photoelectron spectra 10 (1971) 117
Van de Runstraat, C.A., see Fournier 9 (1971) 426

Van der Waals, J.H., see Schmidt 1 (1967) 434
Van der Waals, J.H., see Schmidt 2 (1968) 640
Van der Waals, J.H., see Schmidt 3 (1969) 546
Van der Waals, J.H., see Chan 4 (1969) 269
Van der Waals, J.H., see Schmidt 4 (1969) 341
Van der Waals, J.H., see Antheunis 6 (1970) 255
Van der Waals, J.H., see Veeman 7 (1970) 65
Van der Waals, J.H., see Schmidt 8 (1971) 345
Van der Wiel, M.J., Th.M. El-Sherbini and C.E. Brion, K shell excitation of nitrogen and carbon monoxide by electron impact 7 (1970) 161
Van der Woude, F., see Sawatzky 4 (1969) 335
Van Dijk, F.A. and A. Dymanus, Hyperfine structure of the rotational spectrum of HI in the submillimetre region 2 (1968) 235
Van Dijk, F.A. and A. Dymanus, Hyperfine structure of the rotational spectrum of HBr in the submillimetre wave region 4 (1969) 170
Van Dijk, F.A. and A. Dymanus, The electric dipole moment of HI and HBr 5 (1970) 387
Van Dorp, W.G., see Schmidt 8 (1971) 345
Van Duijnen, P.Th., see Cook 8 (1971) 201
Van Duijneveldt, F.B., see van Duijneveldt-van de Rijdt 2 (1968) 565
Van Duijneveldt-van de Rijdt, J.G.C.M. and F.B. van Duijneveldt, Perturbation calculations on the variation of hydrogen-bond energies with intermolecular distance 2 (1968) 565
Van Everv, J., see Parker 8 (1971) 94
Van Hook, W.A., see Legros 1 (1968) 696
Van Hook, W.A., see Legros 2 (1968) 249, 251
Van Itallie, F.J., see Doemeny 4 (1969) 302
Van Kreveld, M.E. and J. van der Elsken, A comparison of the pressure effect on the pure rotational and vibration rotation spectra of HCl 1 (1968) 532
Van Kreveld, M.E., R.M. van Aalst and J. van der Elsken, The pressure effect of noble gases on the pure rotational spectrum of hydrogen chloride 4 (1970) 580
Van Leuven, J.C., see Silverman 7 (1970) 37
Van Rens, J.G.M., see van Willigen 2 (1968) 283
Van Vechten, J.A., see Phillips 5 (1970) 159
Van Voorst, J.D.W., see Prins 1 (1967) 54
Van Voorst, J.D.W., W.G. Zijlstra and R. Sitters, ESR of biradicals of dipyridyl mononegative ions and alkali ions 1 (1967) 321
Van Voorst, J.D.W., see Glasbeek 2 (1968) 312
Van Voorst, J.D.W., see Gijzeman 5 (1970) 269
Van Voorst, J.D.W., see Lagendijk 6 (1970) 152
Van Voorst, J.D.W., see Langelaar 6 (1970) 460
Van Voorst, J.D.W., see Langelaar 7 (1970) 368
Van Voorst, J.D.W., see Zijlstra 7 (1970) 553
Van Voorst, J.D.W., see Glasbeek 8 (1971) 372
Van Voorst, J.D.W., see Giling 8 (1971) 457
Van Voorst, J.D.W., see Kloosterboer 8 (1971) 462
Van Voorst, J.D.W., see Werkhoven 9 (1971) 6
Van Voorst, J.D.W., see Lavalette 9 (1971) 230
Van Voorst, J.D.W., see Post 10 (1971) 468
Van Willigen, H., see Canters 1 (1968) 627

Van Willigen, H. and J.G.M. van Rens, Quadrupole effects on the hyperfine structure of a gold (II) complex 2 (1968) 283
Van Wolput, J.H.M.C., see Koningsberger 8 (1971) 145
Varma, C.A.G.O. and L.J. Oosterhoff, The polarizability of tetracene in its first excited singlet state 8 (1971) 1
Varma, C.A.G.O. and L.J. Oosterhoff, The behaviour of the charge transfer band of E.D.A. complexes in a strong electric field 9 (1971) 406
Vaubel, G., Intersystem crossing between guest and host molecules in anthracene mixed crystals 9 (1971) 51
Vaubel, G., H. Baessler and D. Möbius, Reaction of singlet excitons at an anthracene/metal interface: energy transfer 10 (1971) 334
Vedrine, J.C., see Leniart 6 (1970) 637
Veeman, W.S., see Schmidt 4 (1969) 341
Veeman, W.S. and J.H. van der Waals, Level anticrossing and cross-relaxation in phosphorescent benzophenone crystals 7 (1970) 65
Vegter, J.G., T. Hibma and J. Kommandeur, New phase transitions in simple M–TCNQ–salts 3 (1969) 427
Veillard, A., Distortional effects on the ethane internal rotation barrier and rotation barriers in borazane and methylsilane 3 (1969) 128
Veillard, A., Comments on "geometrical changes during the internal rotation in ethane" 3 (1969) 565
Veillard, A., Distortional effects on the internal rotation in hydrogen peroxyde 4 (1969) 51
Veillard, A. and J. Demuynck, Barrier to internal rotation in hydrogen persulphide 4 (1970) 476
Veillard, A., see Dedieu 5 (1970) 328
Veillard, A., see Demuynck 6 (1970) 204
Veillard, A., see Demuynck 10 (1971) 522
Veillard, H. and B. Rees, Conformation and hyperfine splittings of the acetyl radical through ab initio calculations 8 (1971) 267
Velthorst, N.H., see Van der Kooy 3 (1969) 12
Veracini, C.A., see Bucci 3 (1969) 55
Veracini, C.A., see Barili 8 (1971) 229
Veracini, C.A., see Bucci 8 (1971) 421
Verdieck, J.F., S.H. Peterson, C.M Savage and P.D. Maker, Hyper-Raman spectra of methane, ethane and ethylene in gas phase 7 (1970) 219
Verhaegen, G., J.J. Berger, J.P. Desclaux and C.M. Moser, A priori calculation of the 1s and 2s hole states in neon 9 (1971) 479
Verma, A.L. and H.D. Bist, Excited state geometry of chlorobenzene 4 (1970) 577
Verman, S.P., see Pant 9 (1971) 546
Vértes, A., see Dézsi 2 (1968) 665
Vetchinkin, S.I. and S.V. Kchristenko, The Coulomb–Green's function calculation of the second-order interaction of a hydrogen atom with the radiation field 1 (1967) 437
Victor, G.A., see Dalgarno 7 (1970) 265
Vidal, B., M.-P. Bassez and P. Goudmand, Reactions of active nitrogen with tellurium atoms 5 (1970) 398
Vietzke, E., see Schlier 3 (1969) 250
Vietzke, E., see Welge 10 (1971) 13
Villa, J.F. and E.E. Hatfield, The magnetic susceptibility of bis (tyrosinato) copper(II) from 4.5 to 55°K 9 (1971) 568

Villarejo, D., R. Stockbauer and M. Inghram, Large vibration–rotation interaction effects in calculated Frank–Condon factors 2 (1968) 11
Vincent, J.S., EPR spin parameters of the triplet state of 1,5-naphthyridine 8 (1971) 37
Vinot, G., see Demuynck 10 (1971) 522
Virlet, J. and R. Rigny, Ultra-slow reorientational motions in solid molybdenum hexafluoride 4 (1970) 501
Virlet, J. and P. Rigny, NMR study of molecular diffusion in solid hexafluorides 6 (1970) 377
Virmani, Y.P., J.D. Zimbrick and E.J. Zeller, ESR studies of hydrogen trapped in alkali halides by proton irradiation 6 (1970) 508
Vishwamittar, S.P. Taneja and S.P. Puri, Crystal field calculations of magnetic and thermal properties of Tb^{3+} ion in C_{3h} field 9 (1971) 495
Visser, A.J.W., see Glasbeek 2 (1968) 312
Vodar, B., see Roncin 3 (1969) 197
Vojtík, J. and M. Tomášek, On a multiple scattering model for polyatomic molecules 6 (1970) 189
Vojtík, J., V. Kvasnička and P. Rosmus, Additional constants of motion of CNDO-like many-electron hamiltonians of planar molecular systems 9 (1971) 323
Von Ammon, R. and B. Kanellakopulos, Nuclear magnetic resonance shifts of paramagnetic organometallic actinide complexes. (I). ^{1}H-NMR studies of uranium-(IV)tetracyclopentadienide 2 (1968) 513
Von Ammon, R. and R.D. Fischer, NMR evidence for electron spin delocalization in organometallic U(IV)-compounds 4 (1970) 553
Von Ellenrieder, G., E. Castellano and H.J. Schumacher, The kinetics and the mechanism of the photochemical decomposition of ozone with light of 2537 Å wavelength 9 (1971) 152
Von Seggern, M. and J.P. Toennies, A unitarised Born approximation for rotational excitation 5 (1970) 613
Vorachek, J.H., see Dhingra 9 (1971) 17
Voronin, A.I., see Andreev 3 (1969) 488
Vriezen, W.H.N. and F. Jellinek, Phosphororus–aluminium spin–spin coupling by coordinative bonding 1 (1967) 284
Vroom, D.A., see Frost 1 (1967) 93
Vroom, D.A., A.R. Comeaux and J.W. McGowan, Angular distributions of photoelectrons emitted from argon by 584 Å and 744, 736 Å radiation 3 (1969) 476
Vroom, D.A., see McGowan 3 (1969) 614

Wada, A., Dielectric evidence of chemical relaxation in the helix-coil transition of polypeptides 8 (1971) 211
Waddington, T.C., see Dixon 10 (1971) 600
Waech, T.G. and R.B. Bernstein, Production of focused beams of polar diatomic molecules in selected vibrational-rotational states 2 (1968) 477
Waggoner, M.G., K.W. Chow and A.L. Smith, Direct-recording absorption spectrometer in the windowless vacuum-ultraviolet: absorption spectra of He_2, HF and N_2 3 (1969) 151
Wagner, O.E., L.G. Christophorou and J.G. Carter, Lifetimes of liquid benzene, toluene and mesitylene excited by a pulsed-electron beam 4 (1969) 224
Wakayama, N. and D.F. Williams, Singlet exciton-charge carrier interaction in anthracene 9 (1971) 45
Walker, D.C. and S.C. Wallace, Nanosecond pulse radiolysis effect studied spectrographically 6 (1970) 111
Walker, D.C., N.V. Klassen and H.A. Gillis, Solvated electrons in dimethylsulphoxide 10 (1971) 636
Walker, T.E.H., Sources of error in open shell Hartree–Fock calculations 9 (1971) 174
Wallace, S.C., see Walker 6 (1970) 111

Walrafen, G.E., see Colles 4 (1970) 621
Walrafen, G.E., see Colles 5 (1970) 540
Wan, J.K.S., see Gee 7 (1970) 311
Wankenne, H. and J. Momigny, Monomolecular and collision induced processes for the appearance of metastable diatomic ions 4 (1969) 132
Wanner, J., see Kompa 3 (1969) 210
Wanner, J., see Gensel 5 (1970) 179
Wanner, J., see Gensel 7 (1970) 583
Wannier, P., P.M. Rentzepis and J. Jortner, Small molecule characteristics of the radiative decay of highly excited states of some large molecules 10 (1971) 102
Wannier, P., P.M. Rentzepis and J. Jortner, Resonance fluorescence from the second excited state of naphthalene 10 (1971) 193
Wäppling, R., L. Häggström and S. Rundqvist, The space group symmetry of β-$FeSi_2$ as determined by Mössbauer spectroscopy 2 (1968) 160
Wäppling, R., see Häggerström 4 (1969) 107
Ward, G.A. and J.C.W. Chien, Contact hyperfine interaction and induced dynamic nuclear spin polarization 6 (1970) 245
Ware, W.R., P. Chow and S.K. Lee, Timeresolved nanosecond emission spectroscopy: spectral shifts due to solvent-solute relaxation 2 (1968) 356
Ware, W.R., B.K. Selinger, C.S. Parmenter and M.W. Schuyler, The absolute rates of radiative and of nonradiative decay from three vibronic levels in isolated $^1B_{2u}$ benzene molecules 6 (1970) 342
Warfield Teague, M., see Shain 3 (1969) 550
Warneck, P., Photodetachment of NO_2^- 3 (1969) 532
Warren, K.D., see Ranson 10 (1971) 236
Warren, L.E. and W.E. Hatfield, Low temperature magnetism and EPR of diacetylbis-(thiosemicarbazone) copper (II) 7 (1970) 371
Warshel, A. and S. Lifson, An empirical function for second neighbor interactions and its effect on vibrational modes and other properties of cyclo- and *n*-alkanes 4 (1969) 255
Warsop, P.A., see Bell 5 (1970) 214
Wartell, M.A. and R.J. Cross Jr., The sudden approximation as applied to vibrationally inelastic scattering 5 (1970) 477
Wasserman, E., K. Schueller and W.A. Yager, EPR detection of the septet ground state of a trinitrene 2 (1968) 259
Wasserman, E., W.A. Yager and V.J. Kuck, EPR of CH_2: a substantially bent and partially rotating ground state triplet 7 (1970) 409
Watkins, A.R., see Grellmann 9 (1971) 439
Watson, K.J., see König 6 (1970) 457
Watts, D.C., see Williams 8 (1971) 485
Watts, R.J., R.W. Harrigan and G.A. Crosby, Temperature and magnetic-field effects on the luminescence lifetimes of complexes of ruthenium (II) and iridium (III) 8 (1971) 49
Watts, R.O., see Barker 3 (1969) 144
Wayne, R.P., see Clark 3 (1969) 93, 405
Wayne, R.P., see Izod 4 (1969) 208
Weare, J.H. and R.G. Parr, A stationary principle for discontinuous trial functions and a framework for zero-differential-overlap theories of electronic structure 1 (1967) 349
Webb, G.A., see Honeybourne 2 (1968) 426
Webb, R.H., see Nguyen Van Nghia 2 (1968) 176

Webber, S.E., The external heavy atom effect on radiative and radiationless transitions from the benzophenone-sensitized triplet of some perdeuterated and perprotonated aromatic hydrocarbons 5 (1970) 466
Wecht, K.W., see Colles 4 (1970) 621
Wecht, K.W., see Colles 5 (1970) 540
Wegdam, G.H., R. Bonn and J. van der Elsken, Far infrared absorption spectra of some solid and fused alkalimetal nitrates 2 (1968) 182
Wegdam-van Beek, J., see Langelaar 6 (1970) 460
Wegdam-van Beek, J., see Langelaar 7 (1970) 368
Wei, P.S.P., see Trajmar 1 (1968) 703
Weill, G., see André 9 (1971) 27
Weinreb, A., see Loewenthal 2 (1968) 29
Weinreb, A., see Mansour 2 (1968) 653
Weinreb, A., see Berlman 2 (1968) 657
Weinreb, A., see Tomkiewicz 3 (1969) 229
Weinreb, A. and A. Werner, On the intrinsic fluorescence of estrone 3 (1969) 231
Weinreb, A., see Berlman 4 (1969) 338
Weis, P., see Herre 7 (1970) 276
Weisheit, J.C. and A. Dalgarno, Model potential calculations of sodium and potassium oscillator strengths 9 (1971) 517
Weissman, S.I., see Levanon 6 (1970) 19
Weissman, S.I., see Komarynsky 7 (1970) 211
Weissman, S.I., see Levanon 10 (1971) 25
Weissmann, M., L. Blum and N.V. Cohan, On the hydrogen bond in an ice-like structure 1 (1967) 95
Weissmann, M. and N.V. Cohan, A molecular orbital calculation for the hydrated electron 7 (1970) 445
Welge, K.H., A. Zia, E. Vietzke and S.V. Filseth, Temperature dependence of the reaction $O(^1S) + CO_2$ 10 (1971) 13
Weller, A., see Beens 2 (1968) 140
Weller, A., see Beens 3 (1969) 666
Weller, A., see Nickel 4 (1969) 27
Weller, A., see Beens 8 (1971) 341
Weller, A. and K. Zachariasse, Chemiluminescence from radical ion recombination. Experimental evidence for triplet–triplet annihilation mechanism 10 (1971) 197
Weller, A. and K. Zachariasse, Determination of chemiluminescence quantum yields of radical ion reactions 10 (1971) 424
Weller, A. and K. Zachariasse, Direct hetero-excimer formation from radical ions 10 (1971) 590
Wendell, K., see Searcy 8 (1971) 123
Wennerström, H., see Lindblom 8 (1971) 489
Wenning, U., see Comes 5 (1970) 195, 199
Werkhoven, C.J., P.A. Geldof, M.F.M. Post, J. Langelaar, R.P.H. Rettschnick and J.D.W. van Voorst, Incomplete vibrational relaxation of pyrene in its first excited singlet state in the vapour phase 9 (1971) 6
Werkhoven, C.J., see Lavalette 9 (1971) 230
Werner, A., see Weinreb 3 (1969) 87
Werner, G.K., see Nugent 7 (1970) 179
Wessel, J.E., see Hochstrasser 10 (1971) 452
West, M.A., see Formosinho 6 (1970) 7

Westenberg, A.A., J.M. Roscoe and N. de Haas, Rate measurements on $N + O_2 (^1\Delta_g) \rightarrow$ $\rightarrow NO + O$ and $H + O_2 (^1\Delta_g) \rightarrow OH + O$ 7 (1970) 597
Weston Jr., R.E. and S. Ehrenson, Hydrogen exchange and abstraction in the $H + CH_4$ system as calculated by the CNDO/2 method 9 (1971) 351
Westwood, N.P.C., see Frost 10 (1971) 347
Wexler, S., see Parks 10 (1971) 245
Wharton, J.H., see Chopin 3 (1969) 552
Wheatley, J.K., see Sandler 10 (1971) 375
Whisnant, D.M., see Byers Brown 7 (1970) 329
White, I.F., see Clyne 6 (1970) 465
White, J.M., Energy disposal in the hot hydrogen atom isotope exchange reaction (H, HD) 4 (1969) 441
White, W.F. and J.E. Wollrab, Rotational spectrum of ethylene episulphoxide 3 (1969) 25
Whitehead, M.A., see Boyd 2 (1968) 227
Whiteman, J.D., see Hochstrasser 10 (1971) 452
Whittem, R.N., see Hurst 1 (1968) 647
Whitten, D.G., see Pedersen 3 (1969) 569
Whittle, M.J., A.P. Cox and C. Roberts, First and second order Coriolis interactions in symmetric top molecules: application to the microwave spectrum 9 (1971) 42
Wickman, H., see Simopoulos 7 (1970) 615
Wickman, H.H. and F.R. Merritt, Ground term crystal field parameters and Mössbauer paramagnetic hfs in a spin $\frac{3}{2}$ iron III complex 1 (1967) 117
Wickman, H.H., see Brackett 6 (1970) 75
Wiegand, J., see Bücher 3 (1969) 508
Wiersma, D.A. and W.C. Nieuwpoort, Electron spin resonance of photochromic β-tetrachloro–α–ketonaphthalene 2 (1968) 637
Wiesenfeld, J.R., see Deakin 10 (1971) 146
Wilke, G., see Traunmüller 3 (1969) 300
Will, G., see Patscheke 2 (1968) 47
Williams, D.F., see Wakayama 9 (1971) 45
Williams, D.J., see Mulcahy 7 (1970) 455
Williams, F., see Lin 1 (1967) 66
Williams, F., see Bonin 2 (1968) 363
Williams, F., see Sprague 10 (1971) 299
Williams, G. and D.C. Watts, Dielectric relaxation of di-*n*-hexyl ketone and di-*n*-nonyl ketone in cyclohexane solution 8 (1971) 485
Williams, G. and P.J. Hains, Molecular motion in the supercooled liquid state: small molecules in slow motion 10 (1971) 585
Williams, J.F., see McGowan 3 (1969) 614
Williams, M.L., see Hush 5 (1970) 507
Williams, M.L., see Hush 6 (1970) 163
Williams, M.L., see Hush 8 (1971) 179
Williams, P.G.L. and G.M. Bancroft, The analytical determination of the hyperfine parameters in the Mössbauer spectroscopy of iron 3 (1969) 110
Williams, R.H., see Adams 10 (1971) 297
Williamson, W.B., J.H. Lunsford and C. Naccache, The EPR spectrum of O^- on magnesium oxide 9 (1971) 33
Willig, F., see Michel-Beyerle 5 (1970) 281
Willis, C. and C. Devillers, The pulse radiolysis of carbon monoxide 2 (1968) 51

Willis, H.A., see Chantry 10 (1971) 473
Wilson Jr., C.W. and W.A. Goddard III, Exchange kinetic energy, contragradience and chemical binding 5 (1970) 45
Wilson, J.F., see Lempert 8 (1971) 67
Wilson, M., see Mitchell 3 (1969) 389
Windsch, W., see Kirmse 4 (1970) 565
Winfield, J., see McFarlane 6 (1970) 547
Winter, N.W., V. McKoy and A. Laferriere, Solution of the Hartree–Fock first-order equation for the helium atom 6 (1970) 175
Winter, N.W. and T.H. Dunning Jr., Accelerating the convergence of matrix Hartree–Fock calculations 8 (1971) 169
Wirsam, B., Combined SCF and CI calculations of the spectrum of SiH 10 (1971) 180
Wise, H., Transport coefficients of gas mixtures of atomic and molecular hydrogen 9 (1971) 133
Witkowski, A. and M.Z. Zgierski, Vibronic spectra of the perylene crystal 9 (1971) 336
Witschel, W., Calculation of the vibrational partition function of polyatomic molecules including Fermi- or Darling–Dennison-resonance 2 (1968) 349
Wojnar, R., see Steeki 2 (1968) 343
Wolf, F.A., see Levine 10 (1971) 2
Wolf, H.C., see Braun 9 (1971) 260
Wolfe, J.P., Direct measurement of spin–lattice relaxation rates for the localized triplet state in molecular crystals; evidence for one- and two-phonon processes 10 (1971) 212
Wolfgang, R., see Krenos 10 (1971) 17
Wollrab, J.E., see White 3 (1969) 25
Wood, A.R., see Bardsley 1 (1967) 359
Wood, D.E., see Ferrell 9 (1971) 343
Wood, J.S., see Davis 4 (1969) 466
Wood, M.H., see Hillier 7 (1970) 323
Wood, P.M., see Callear 5 (1970) 128
Woodcock, L.V., Isothermal molecular dynamics calculations for liquid salts 10 (1971) 257
Wormer, P.E.S., Russell–Saunders states arising from configurations of equivalent electrons 5 (1970) 355
Wotherspoon, N., M. Pope and J. Burgos, Fluorescence modulation in anthracene by singlet exciton–trapped hole interaction 5 (1970) 453
Wratten, R.J., A comment on some approximations for the resonance integrals used in semi-empirical calculations 1 (1968) 667
Wright, J.S., see Mulder 5 (1970) 445
Wright, J.S., A comparison of H_4 and H_6 as transition states for the hydrogen–deuterium exchange reaction 6 (1970) 476
Wyatt, R.E., see Jackson 4 (1970) 643
Wyatt, R.F., see Hunter 6 (1970) 221
Wyrsch, D. and H. Labhart, Magnetic field effects on P-type delayed fluorescence of 1, 2-benzanthracene in solution 8 (1971) 217

Yager, W.A., see Wasserman 2 (1968) 259
Yager, W.A., see Wasserman 7 (1970) 409
Yamamoto, N., see Mataga 1 (1967) 119
Yamamoto, N., see Tsubomura 1 (1967) 309
Yamamoto, N., see Nakato 2 (1968) 57
Yamanaka, Ch., see Egawa 8 (1971) 108

Yamazaki, K., see Kihara 9 (1971) 62
Yandle, J.R., see Clack 1 (1967) 157
Yandle, J.R., see Hush 1 (1967) 493
Yang, N.C., S.L. Murov and Tsu–Chia Shich, Radiationless decay processes in 2-naphthaldehyde 3 (1969) 6
Erratum 5 (1970) 60
Yankelevich, A.Z., see Kessenikh 9 (1971) 347
Yardley, J.T., see Sackett 6 (1970) 323
Yardley, J.T., see Sackett 9 (1971) 612
Yardley, J.T., G.W. Holleman and J.I. Steinfeld, Time-resolved fluorescence from the ^1A_u state of glyoxal 10 (1971) 266
Yaris, R., see Schaefer 1 (1967) 173
Yaris, R., see Sitz 1 (1967) 177
Yaris, R. and A.L. Shain, A general method for the calculation of lineshapes of molecular spectra 3 (1969) 597
Yates, A.C., Relativistic effects in high-energy inelastic electron–atom collisions 6 (1970) 49
Yatsiv, S., see Rosenwaks 9 (1971) 266
Yen Chu, M. and J.S. Dahler, Collision-induced singlet–triplet transition of methylene 8 (1971) 369
Yip, S., see Agrawal 2 (1968) 584
Yogev, A., L. Margulies and Y. Mazur, Application of linear dichroism measurements to highly symmetric chromophores 8 (1971) 157
Yonezawa, T., H. Nakatsuji, T. Kawamura and H. Kato, Spin polarization and spin delocalization in unrestricted Hartree–Fock method 2 (1968) 454
Yonezawa, T., see Nakatsuji 4 (1970) 607
Yonezawa, T., see Nakatsuji 6 (1970) 541
Yonezawa, T., see Morishima 7 (1970) 633
Yonezawa, T., see Morishima 9 (1971) 143, 203
Yoshihara, K., T. Kasuya, A. Inoue and S. Nagakura, Time resolved spectra of pyrene excimer and pyrene-dimethylaniline exciplex 9 (1971) 469
Yoshimura, T., see Miyake 4 (1969) 275
Yttermo, B., see Jansson 4 (1969) 188
Yue, C.P. and R.L. Somorjai, Integral transform gaussian wavefunction for H_2^+ 5 (1970) 537
Yuriev, M.S., see Dmitriev 4 (1969) 43, 45
Yuriev, M.S., The variational upper and lower bounds for stopping powers of atoms and molecules 6 (1970) 172

Zachariasse, K., see Weller 10 (1971) 197, 424, 590
Zanazzi, E., see Rovida 3 (1969) 201
Zandstra, P.J., see Drent 2 (1968) 526
Zare, R.N., see Mills 5 (1970) 37
Zare, R.N., see Ottinger 5 (1970) 243
Zare, R.N., see Jonah 9 (1971) 65
Zauli, C., see Bendazolli 8 (1971) 556
Žekš, B., see Lavrenčič 5 (1970) 441
Zeller, E.J., see Virmani 6 (1970) 508
Zeller, M.V. and R.G. Hayes, Evidence from X-ray photoelectron spectroscopy on the charge distribution in various chromium compounds 10 (1971) 610

Zelsmann, H.R., F. Bellon, Y. Marechal and B. Bullemer, Polymorphism in crystalline formic acid 6 (1970) 513
Zembekov, A.A. and E.E. Nikitin, Excitation transfer in collisions of highly excited alkali atoms. Cesium–cesium collisions 9 (1971) 213
Zerbi, G., see Piseri 2 (1968) 127
Zerbi, G., see Gussoni 2 (1968) 145
Zewail, A.H., see Hochstrasser 10 (1971) 452
Zgierski, M.Z., see Witkowski 9 (1971) 336
Zhidomirov, G.M., N.D. Chuvylkin and O.I. Brotikovsky, On the calculations of the anisotropic hyperfine coupling constants of CH_3 and NH_2 free radicals 10 (1971) 341
Zhogolev, D.A. and I.V. Matyash, A study of intermolecular energies in small water polymers by the extended Hückel method 10 (1971) 444
Zia, A., see Welge 10 (1971) 13
Ziegler, T., see Dahl 6 (1970) 64
Zijlstra, W.G., see van Voorst 1 (1968) 321
Zijlstra, W.G., J.M. Henrichs, J.H.M. Mooy and J.D.W. van Voorst, Gas phase ESR spectra of ^{31}P, ^{75}As, ^{121}Sb and ^{123}Sb 7 (1970) 553
Zimbrick, J.D., see Virmani 6 (1970) 508
Zinich, J., see Loehr 7 (1970) 183
Živković, T. and N. Trinajstić, Novel expressions for electronic density distribution calculations 2 (1968) 369
Zmbov, K.F., Mass spectrometric determination of the dissociation energies of calcium and barium chlorides 4 (1969) 191
Zuhrt, Ch., see Krell 4 (1969) 261
Zülicke, L., see Krell 4 (1969) 261
Zupančič, I., see Blinc 4 (1969) 363
Zupančič, I., see Blinc 9 (1971) 85
Zwarich, R.J. and L. Goodman, Out-of-plane vibrations in $T(n\pi^*) \rightarrow S_0$ of benzaldehyde 7 (1970) 609
Zwarich, R., see Koyanagi 9 (1971) 74
Zweig, A., see Brinen 3 (1969) 305

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Internal Friction of Structural Defects in Crystalline Solids

By R. DE BATIST, Studiecentrum voor Kernenergie, Mol, and University of Antwerp

1972. 474 pages. Dfl. 120.00 (ca. $ 37.50) ISBN 0 7204 1755 4

'Defects in Crystalline Solids', Volume 5

Presents in a single volume a thorough discussion of the kind of information about defects in solids which can be obtained from internal friction measurements. Following a chapter about those aspects of crystal structure and structural defects required for interpreting such experiments, a formal description is given of non-elastic effects, including some effects of anharmonicity. Thermodynamic aspects and experimental observability of relaxation processes are discussed extensively. A survey of some of the most widely used experimental techniques for internal friction studies concludes the first part of the monograph. The second part deals with applications to 'defectology': point defects, dislocations and internal boundaries. Relaxation effects due to point defects are first described formally in a very general way; applications of various aspects of the theory are then illustrated by a number of examples. Dislocations can contribute in a variety of ways to the internal friction of a solid. These internal friction effects and the resulting information about dislocation properties (Peierls stress, damping constant, interaction energy with pcint defects, etc.) are fully discussed theoretically and illustrated with experimental results. The monograph concludes with a chapter about internal friction effects related with internal boundaries (magnetic domains, grain boundaries, twin boundaries, etc.).

CONTENTS:

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Internal friction
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